ILLINOIS MEDICAL JOURNAL

THE OFFICIAL ORGAN OF
THE ILLINOIS STATE MEDICAL SOCIETY

ENTERED IN THE SPRINGFIELD POSTOFFICE AS SECOND-CLASS MATTER.

VOL. XVI SPRINGFIELD, ILL., NOVEMBER, 1909 No. 5

ORIGINAL ARTICLES

THE CLINICAL SIGNIFICANCE OF ALBUMIN AND CASTS IN THE URINE.*

ARTHUR R. ELLIOTT, M.D.
CHICAGO.

The clinical significance of albumin in the urine is one of those perennial medical problems that are being forever discussed and never satisfactorily and finally solved. The difficulties besetting an unprejudiced consideration of this question arise largely from our inability to divest our minds of prejudices begotten by the older teachings. In former times albuminuria and Bright's disease were terms of nearly identical practical significance. In the light of knowledge more recently accumulated, no such definite significance can any longer be attached to albuminuria, common clinical experience demonstrating that it is not always a faithful symptom of Bright's disease, nor does it invariably imply the existence of a renal lesion. Notwithstanding this more enlightened viewpoint, it still remains a fact that in the ordinary course of practice physicians look on albuminuria as indicative of nephritis unless the evidence in favor of some other etiologic condition is overwhelming. The problem of the clinical interpretation of albuminuria becomes greatly simplified if we grant at the outset that it is a symptom which *per se* has no fixed value as a diagnostic sign except perhaps the broad general significance that some derangement of the genitourinary system exists.

The kidney is a highly differentiated organ, which in the performance of its excretory functions, is exceptionally subject to irritations that may on one hand initiate grave organic defects or on the other merely appear as slight and transient alterations which undergo satisfactory resolution without permanent impairment of structure. In either event albumin

* Read in a Symposium on Nephritis at the Fifty-Ninth Annual Meeting of the Illinois State Medical Society, Quincy, May 18, 1909.

may appear in the urine, and the mere fact of its presence fail to throw much light either on the nature or probable course of the condition giving rise to it, its significance being judged very largely on the symptoms presented by the patient. This is not always easy, nor indeed possible, since grave organic defects of the kidneys may exist and give rise to few other symptoms except albuminuria, while, on the other hand, cases frequently occur in which albumin in considerable quantity may exist in the urine for a long time without entailing serious consequences, either general or renal. This renders the interpretation of cases presenting albuminuria without any other marked symptom oftentimes a matter of singular difficulty.

As a symptom, albuminuria is to be distinctly held in mind as not only an accompaniment of Bright's disease, but as well of acute and chronic inflammatory conditions of other portions of the genitourinary tract. It may result from blood changes, as is observed in scurvy, purpura, leukemia, etc. It is frequently noted as a concomitant of disorders of digestion and elimination. In the zymotic diseases and acute infections it is exceedingly common. In short, any serious disease wherever located tends to produce secondary toxic effects on the renal secreting structure, resulting in the presence of albumin and casts in the urine. Certain static circulatory states, such as result from heart lesions, hepatic cirrhosis, abdominal tumors, etc., produce albuminuria. There is also to be considered the large class of so-called accidental or spurious albuminurias in which albuminous contamination of the urine takes place after it has been secreted by the kidneys.

Notwithstanding the diversity of its etiology, albuminuria, whether transient or permanent, must be regarded as pathologic. The so-called functional albuminurias (cyclic, orthostatic) constitute no exception to this rule. Although albuminuria may not necessarily mean serious organic mischief in the kidneys, it invariably points to some urinary or systemic perversion, and its presence, however slight, demands serious care and consideration before a decision is reached as to its being of no clinical significance.

Notwithstanding the multiplicity of conditions which determine the passage of albumin into the urine, the fact should not be lost sight of that it still constitutes most important evidence of nephritis, and is of immense value in the diagnosis of that condition. While recognizing this fact, it is equally important to bear in mind that the demonstration of albumin in the urine is not a *sine qua non* for the diagnosis of Bright's disease. Albuminuria may be temporarily, mainly, or rarely, entirely absent from the urine during Bright's disease, especially during the interstitial type. It has been noted as absent during chronic parenchymatous nephritis, and during acute nephritis even of the post-scarlatinal form. It is not to be inferred that because albumin is absent in a given case the disease is necessarily mild and non-progressive, for the kidneys may be seriously degenerated and terminal symptoms (uremia, retinitis) present, and yet the urine not show albuminuria. Furthermore, the quantity of albumin in the urine constitutes no just criterion of the gravity

of the kidney lesion. It is true perhaps that when the albumin ranges high in acute nephritis its severity may be taken as a rough gauge of the intensity of the renal involvement. The same may be said of certain cases of chronic parenchymatous nephritis, particularly those displaying amyloid tendencies. In chronic interstitial nephritis the quantity of albumin is wholly unreliable as a means of estimating the extent of the renal gland changes. Cryoscopic studies in nephritis show that comparison of the albumin output and the findings of the freezing point test reveals no direct correspondence between them. By the same means the interesting fact is revealed that the amount of damage to the anatomic structure of the kidney, as shown by the absolute amount of albumin eliminated, is not proportional to the functional disturbance in the kidney, as evidenced by variation in the freezing point.

A form of albuminuria that is encountered during childhood and early adult life to which great interest attaches, is so-called functional albuminuria. The characteristics of this form of albuminuria are that it is transitory, usually intermittent and dependent on some special factor, such as muscular exercise, posture, cold bathing or some particular article of diet, and, moreover, is not accompanied by the systemic and urinary indications of a true nephritis. These albuminurias usually terminate spontaneously without impairment of the renal integrity. At times the albuminuria may follow a definite course, appearing and disappearing with such a degree of regularity at certain times of the day as to assume almost a cycle, hence the term cyclic albuminuria. In many cases the erect position of the body seems to be the determining factor, the albumin disappearing during the night to reappear during the day on the assumption of the upright position. The terms postural and orthostatic are employed to characterize these cases. There is no doubt that this type of albuminuria constitutes a distinct class, and yet too great stress should not be laid on the influence of posture, as it by no means proves that the case is a functional one. There can be no question but that in organic albuminuria dependent on definite renal lesions, often of considerable gravity, the quantity of albumin may be notably influenced by posture. Although I think there is a distinct urinary syndrome that may be appropriately designated orthostatic albuminuria occurring without an accompanying nephritis and dependent on circulatory disturbance in the kidney, the postural characteristics which mark this type of case may prevail to some extent in a great variety of albuminurias of different grades of severity and both of so-called functional and organic origin. In Bright's disease there may be diurnal variations in the amount of albumin passed. It is a point of considerable interest that a case of persistent albuminuria may become one of intermittent or cyclic character, whereas one beginning as a cyclic albuminuria may become permanent and persistent. An inconstant albuminuria with urine free in the morning or evening may be the terminal stage, or perhaps the sequel of a former persistent organic albuminuria. The associated symptoms and physical signs constitute the only sure means of distinguishing whether such an albuminuria rests on a purely functional basis or is the initial

manifestation of a grave renal lesion, or perhaps is the terminal stage of a former organic involvement of the kidneys. Chronic interstitial nephritis is the renal lesion with which functional albuminurias are most likely to be confounded, owing to the fact that in both cases the albumin is slight or intermittent.

As a rule, the greater the quantity of albumin in the urine, the more likely is the case to be one of Bright's disease, as a large quantity of albumin is rarely found except in association with undoubted acute or chronic Bright's. It is necessary, however, in considering the amount of albumin, to have regard, not to the proportion in a single specimen, but to the total excreted in the twenty-four hours. A urine may appear only slightly albuminous, but if it be of low density and large volume the total loss of albumin may be considerable and the existence of renal disease strongly indicated. Indeed, of all urines there is none more suspicious of renal disease than a pale dilute abundant urine which contains albumin. On the other hand, when the urine is only slightly albuminous and is at the same time high colored and concentrated, Bright's disease is usually not present.

There has been much dispute regarding the nature and origin of tube casts. The oldest view is that they consist of coagulated fibrin derived from an exudate, such as is found in inflammation elsewhere in the body. This view is no longer tenable, in consideration of the fact that casts unquestionably occur in the urine in conditions where there is not the slightest sign of inflammation, such as renal congestion and simple amyloid kidney. Moreover, casts do not give the same chemical reactions as fibrin. Their failure to occur in many cases of albuminuria seem to indicate that they do not consist of coagulated albumin, as some have held. Furthermore, there is no fixed ratio between the amount of albumin in the urine and the number of casts. The occurrence of casts without albumin in those forms of infection and intoxication in which degeneration and disintegration of the tubular epithelium have been proved, suggests that they are formed from these epithelial elements, and this is the view most generally held. Exactly how this takes place, whether by a secretion from the cells or by a destruction of the cells and their conversion, is not explained. It may be stated that casts are always indicative of a pathologic process in the kidney, more particularly in the epithelial elements, ranging from a mere nutritional or functional disturbance to extensive destruction of the parenchyma. It goes without saying that epithelial casts indicate desquamation of epithelium, fatty, granular and hyaline casts a degenerative process; casts covered with leucocytes an inflammatory process and casts with red blood cells adherent, hemorrhage within the parenchyma. The presence of epithelial casts and the various forms of metamorphosed casts is of the highest diagnostic value. They point unequivocally to disease of the tubular structures of the kidney. The freer from degenerative markings the cast cells are, the more acute it may be inferred is the degree of inflammation.

The metamorphosed epithelial casts always indicate a serious disease of the kidney. An attempt to base a prognosis in any individual case upon the size, diameter and conformation of the casts is of doubtful value, it being very questionable if they offer criteria of sufficient accuracy to form a basis for exact conclusions. Neither is it permissible to draw exact inference from the number of casts present. As a general rule, their number is in proportion to the severity of the nephritis, but there are so many exceptions to this rule as to disqualify it for a good working hypothesis.

There has been much discussion as to the clinical significance of hyaline casts. Since the centrifuge came into general use for the concentration of urinary sediments, hyalin casts are found in many instances in which neither clinical history nor chemical analysis warrants their presence. Inasmuch as these bodies may be present for weeks and months without other indications of renal impairment, the question naturally arises whether they may not exist in urine from kidneys which are practically normal. We are here confronted with the same difficulty as exists in the interpretation of transitory and intermittent albuminuria. Their appearance always points to some abnormality of the kidney, although this may be nothing more than a transitory circulatory disturbance or a mild degree of toxic irritation of the parenchyma. The factor concerned in their production may be an autotoxis or even an unusual and persistent degree of acidity and concentration of the urine. This cylindruria may be transient and may lead to no permanent anatomic lesions, but it is nevertheless pathologic. While not placing too rigid an interpretation on the occurrence of hyalin casts in small numbers, one should always be on guard in such cases, for while they do not necessarily indicate an established nephritis, they may point to a beginning process or, rarely, be the only microscopic indication of an extensive interstitial lesion. As a rule, they are much more significant in young individuals than in those advanced in life in whom arteriosclerosis is becoming established. If with these casts there are present in the urine sediment cylindrical epithelial cells, there is reason to believe that they may indicate a beginning nephritis.

In conclusion, it may be emphasized as a fact that a trace of albumin and hyalin casts in the urine are too often magnified in importance and that the clinical condition as a whole is often not sufficiently considered. Albuminuria and cylindruria have not the fixed diagnostic value they were once supposed to possess. In cases of suspected renal disease the urine should be repeatedly examined and its fluctuations taken into account, and above all things no clinical construction should be placed on urinary findings until a careful investigation has been made of the symptoms and physical signs presented by the patient.

THE NATURE OF THE CARDIOVASCULAR CHANGES IN NEPHRITIS.*

ALFRED C. CROFTAN, M.D.
CHICAGO.

AUTHOR'S ABSTRACT.

In attempting to interpret the cardiovascular lesions occurring together with nephritis, it is important to remember that, on the one hand, many cases of nephritis run their whole course without the appearance of any cardiovascular manifestation whatsoever, whereas, on the other hand, cases of nephritis occur in which increased blood tension makes its appearance within forty-eight hours after the onset of the renal difficulty and rapidly lead to organic cardiac and arterial lesions that persist throughout the course of the disease.

One can hardly say that any particular form of nephritis, using the orthodox text-book classification, is accompanied by cardiovascular changes and any other form not. I have gained the impression that particularly those varieties of nephritis in which the glomeruli are primarily involved or in which the glomeruli participate in a pan-nephritis become complicated by cardiovascular changes.

It is difficult to explain this sequence of events. Hypothetically one might postulate that the glomeruli are intended to excrete certain pressor principles and that in disease of the glomeruli the latter are retained, thus producing high tension and cardiovascular changes. A much more seductive explanation, based on physiologic reasoning, is the following one: the excretion of urinary end-products through the glomeruli is a true process of filtration and a function of the blood pressure, or by implication, of the rapidity of the blood flow through the glomerular arterioles; whereas the excretion of urinary end-products through the epithelia of the tubules is a glandular process of secretion. In destruction of the glomerular tissue, therefore, any attempt on the part of the organism to compensate for this deficiency implies the production of increased blood pressure in the remaining intact glomeruli. This, as a rule, is brought about by an increase of the general blood pressure throughout the body. Such a process, therefore, while conservative and compensatory, hence useful, as far as the kidney function alone is concerned, may become deleterious and dangerous as far as the organism at large is concerned.

In interpreting the origin of the cardiovascular changes following nephritis, it is important to establish where and how they originate. The first and the most constant and the determining feature is high blood pressure. If this persists for a period of weeks, it is followed, first, by an hypertrophy of the left heart, later by an hypertrophy of the right heart and, finally, by arterial degeneration.

The increased blood tension may originate either from the blood itself, from the heart or from the arteries.

The only factor that could lead to an increase of the blood pressure through the direct agency of the blood (not including, of course, the rôle

* Read in a Symposium on Nephritis at the Fifty-ninth Annual Session of the Illinois State Medical Society, Quincy, May 18, 1909.

of the blood as a carrier of toxic urinary pressor principles) would be an increase in its viscosity, i. e., in its friction. Viscosity determinations in cases of nephritis accompanied by high blood pressure have, however, revealed no constant deviation from the normal.

The heart might lead to increased blood pressure either by an increase of the systolic volume or by a shortening of the systole. The heart's rapidity is, however, not uniformly increased in the disorder under discussion, nor is there any evidence to show that more blood is expelled with each systole than normally.

The most rational explanation is narrowing of the arterial lumen, either in some of the large vessels or in many of the smaller ramifications of the arterial tree, or in both. Even slight narrowing of the arterial lumen, scil., slight arterial contraction would, according to well-known physical laws, promptly lead to a great increase of the general arterial pressure. I do not believe that this narrowing of the lumen is generally due to organic changes in the vessel walls, at least not in the beginning. It is probable that in many cases the changes are secondary to persistent high tension. Presumably we are dealing with a functional narrowing of the lumen, the result of an increased vasomotor tonus. Vasomotor instability is one of the most characteristic post-nephritic manifestations.

All these considerations concern only those forms of cardiovascular degeneration that occur consecutively to nephritis. There remain a large number of cardiovascular disorders in which blood pressure changes either precede or accompany the nephritis. Logically one can distinguish three possibilities, to-wit:

1. The cardiovascular changes precede the nephritis and cause the latter. This, I believe, is the sequence of events seen in true Bright's disease; for in many of these cases we witness high tension long before nephritic symptoms appear. The manifold causes of this high tension need not be discussed at this place. A persistent increase in the arterial pressure in this group of cases ultimately leads to degenerative changes, particularly in those organs of the body that are supplied by end arteries, viz., chiefly the brain, the retina and the kidneys; hence we not infrequently witness high tension accompanied by certain cerebral symptoms and a retinitis "albuminurica" in which the renal manifestations are at first completely absent or only develop at a late period of the disease.

2. The cardiovascular changes develop simultaneously with the nephritis. Here some agency must be operative that affects both the cardiovascular apparatus and the kidneys at the same time. To this category belong chiefly the cardiorenal disorders seen in chronic lead poisonoing and, above all, in the so-called gouty diathesis.

3. The cardiovascular changes are manifestly of renal origin, consecutive to the nephritis and in all probability due to renal inadequacy with retention of toxic urinary pressor end products. This is the most common sequence of events and has been discussed above.

It will be seen how important it is from the standpoint of prognosis and of treatment to attempt in each case of nephritis complicated by cardiovascular disorders an interpretation of the sequence of events.

VALUE AND LIMITATION OF SALT-FREE DIET AND RESTRICTION OF FLUID IN NEPHRITIS.*

CHARLES SPENCER WILLIAMSON, B.S., M.D.
CHICAGO.

Since the pioneer researches of Widal and de Lerniere, which demonstrated that sodium chlorid may, under certain conditions, be harmful to the nephritic, much attention has been paid to the influence of this substance in its relation to the various forms of Bright's disease. The conception of physiologic renal action now held recognizes as the most important factors (in addition to the variations of the general blood pressure and the local changes in blood pressure due to the peculiar structure of the glomeruli) the varying degrees of toxicity of the body fluids and permeability of the membranes. The body fluids, and first and foremost the blood, maintain under normal conditions a fairly constant cryoscopic condition. If there be excessive ingestion of molecules of, let us say, sodium chlorid, the excretory organs, if in a normal condition, eliminate the excess of molecules. This process, which is a stable and accurate one, becomes deranged and perverted under pathologic conditions of the eliminating organs, and of the kidneys in particular, should these become insufficient. The blood, in spite of the difficulty in getting rid by excretion of its excess molecules, makes a strong effort to preserve unchanged its normal molecular concentration, and to accomplish this throws into the tissue fluids the soluble bodies, such as sodium chlorid, which are productive of the increased concentration, thus rendering the tissue fluids, in comparison with the blood, hypertonic.

The proof that sodium chlorid is actually thus present in the tissue fluids is demonstrated by the fact that there is in certain diseases, especially pneumonia, a well-marked chlorid retention, and analyses of feces show that it is not eliminated by the intestine, nor yet is it present in the blood in excess. The obvious deduction is that it is retained in the interstitial fluids. This retention of sodium chlorid in the interstitial tissues produces an edema in proportion to the hypertonicity of the fluid. A considerable mass of evidence has accumulated to show that this does actually occur in a large number of cases of nephritis, and is not merely a theoretical possibility, although even here an occasional dissenting voice is heard. Confining ourselves to those cases of nephritis in which the edema is not of cardiac origin, we may agree with Strauss that the nephritis edemas may be grouped under two heads: first, those in which the edema is due to an inability on the part of the kidney to eliminate water itself; second, an edema due to the accumulation of sodium chlorid.

If we now enquire in what cases of nephritis the withdrawal of sodium chlorid will be likely to be beneficial, our thoughts naturally direct themselves to chronic diffuse nephritis, where the edemas are so persistent and so difficult to remove. There can be, I think, but litttle doubt that here especially the withdrawal of sodium chlorid, or, more properly speaking, its reduction to the lowest practicable amount, is of

* Read in a Symposium on Nephritis at the Fifty-ninth annual session of the Illinois Medical Society, May 18, 1909.

some value. Of this I have convinced myself in a number of cases, and systematic weighing of the patients, which has been practiced by many authors, has shown that the edema may be favorably influenced. The same thing applies with equal force to those cases of acute nephritis of whatever origin. In the cases of chronic interstitial nephritis we must not lose sight of the fact that edema is almost always of cardiac origin. In any event, the amount of edema attributable to the kidney directly is entirely significant and may here be neglected. Ambard and Beaujard (cited from Brouardel) believe that while chlorid retention is not frequently accompanied by edema in chronic atrophic nephritis it plays a rôle in the pathogenesis of both hypertension and polyuria.

The general consensus of opinion seems to be that chlorid retention does not occur to any considerable degree in the atrophic type, as it does in parenchymatous forms. The French writers, even very recent ones, recognizing the importance of the work of Widal and Javal, are still strongly impressed with the value of the milk diet. The *régime lacté* has become almost a fetish with them. The following statement may be taken as representing the position of the French authors:

> To sum up, the régime of dechloridation finds its principal indication in edema. Are we then to substitute it for the *régime lacté* in all the cases of nephritis with dropsy, acute or chronic? We do not think so, because we must not forget the edema is not everything, and that it is of first importance in every nephritic to reduce to the minimum the ingestion of toxic substances with the aliment, and in this respect nothing compares with milk. Moreover, clinical experience shows that the régime of dechloridation does not apply to the cases of nephritis with renal insufficiency, but that it is the régime of choice for those edematous nephritics whose renal permeability is not too gravely compromised.

The same authors think that the great success which they consider they have had with the *régime lacté* in the treatment of edemas of Bright's disease is attributable to the poverty of milk in sodium chlorid (1.30 to 1.80 per litre). They consider that milk presents the three ideal qualities for nephritic diet, namely, a minimal toxicity, diuretic action and low chlorid value.

Attention has been so often called to the one-sidedness of the milk diet that it is unnecessary to criticize it here in detail. When we reflect that milk has a caloric value of approximately 700 per litre, so that, in order to obtain 2,100 calories per diem, 3 litres of milk, containing about 120 grammes of albumin, would be necessary, it is evident that this excessive amount of proteid and large quantity of water would overtax the kidney to an extent that would more than counterbalance any advantage which would accrue from the supposed low toxicity and low chlorid value of milk. It may not be denied that some cases of subchronic nephritis may do fairly well on a strictly milk diet, provided that the permeability of the kidneys for water is not too greatly impaired. We may even, for the sake of argument, grant that the low chlorid value of milk is the cause of such good results. It is, however, not difficult to construct a diet which shall be sufficiently low in chlorids, and which shall not contain such an excessive quantity of proteids and water, and yet have a sufficient caloric value.

One is impressed in the great majority of French authors and, indeed, in most of the writing on the subject of chronic nephritis, with the tendency of the writers to draw sweeping generalizations and to treat nephritis in general, and not a particular case of nephritis in a particular individual. I think it is a fair statement to say that the principal fault of our treatment of nephritis hitherto has been that in this disease, so variable in its clinical manifestations, strict individualization has not been considered of prime importance. The discussion as to the necessity or desirability of the withdrawal of chlorids is deprived of some of its importance by the fact that there are no very cogent reasons speaking against their withdrawal, or reduction to a minimum. In the contracted kidney, inasmuch as nephritic edema due to the retention of chlorids is a symptom of rare occurrence, the question of the withdrawal of chlorids seems to be of very subordinate interest.

In regard to the question of the administration of water in nephritis, the subject is distinctly more complicated, as more factors have to be taken into account. Furthermore, the necessity of obtaining a correct judgment in regard to the administration of water is imperative, because it is quite possible to bring about irreparable injury by a failure to recognize the indications for either its withdrawal or free administration. In this respect again there seems to be a strong tendency in the literature to dogmatize. But a few years ago the pendulum swung toward the copious administration of water in every case of nephritis, acute or chronic, irrespective of the condition of the heart, and quite irrespective of whether the patient showed the evidences of toxemia or not. Following the work of Oertel and von Noorden, the recent tendency has been to restrict the use of water, on the ground that by reason of its absorption into the circulation it increased the tension, thus adding to the work of the already overburdened heart. Scarcely no greater mistake can be made than to generalize broadly in regard to the giving of fluids, inasmuch as the differences are enormous between the acute and the chronic varieties of nephritis, and even in different cases of the separate forms the cases vary enormously.

Premising the remarks I am about to make with the statement of my profound conviction that the strictest individualization is necessary, in other words, that each individual case must be considered absolutely on its own merits, let us proceed to consider the underlying principles which should govern us in the light of our present knowledge in regard to fluid intake. The cases of acute nephritis naturally group themselves into first, those cases of marked oliguria approximating anuria; second, cases of moderate severity with moderate edema but with the kidneys still capable of eliminating fair amounts of water; third, the mild and convalescent cases.

Taking up the cases of the first group, the most acute cases, let us think of the pathology: an enlarged and swollen kidney, beefy red, with tense capsule, the glomeruli greatly distended with blood, so that the difference in pressure between the afferent and efferent artery of the tufts is much greater than normal. Here the indications would seem pretty

clear. The severe oliguria itself, and still more anuria, is the best testimony of the incapacity of the kidney to excrete water, and any attempt at the administration of considerable quantities of water is practically certain to result in water retention and consequent increase of edema. In a few such cases I have obtained the best results with strict starvation for three or even four days, followed later by an exceedingly limited diet, with a minimum amount of fluid, not to exceed a pint daily. It may be well said that one is on the horns of a dilemma. With uremia threatening, the free administration of water would be most desirable to aid in diluting the toxins, but for the absolute certainty that the kidneys would not excrete it. In my experience the *régime lacté*, which involves giving large quantities of water, is in such cases, to say the very least, most injudicious, and yet this régime, as has already been indicated, is almost universal. Georgeopulos found that in uranium-poisoned rabbits those died soonest with toxic symptoms (convulsions), which had had no water, while those that did have water developed no such convulsions. This might be interpreted as indicating the desirability of permitting water in per-acute cases, were it not for the uncertainty as to whether rabbits poisoned by uranium are properly comparable with the per-acute nephritis in man. The period of complete or nearly complete anuria lasts but a few days, as the patient either dies with uremic symptoms or else makes such improvement that he falls into the second group of cases.

In this second group we have moderate edema with uremic symptoms not prominent and the kidneys eliminating fair amounts of water. In this group a somewhat different plan should be followed. Bearing in mind that the chief danger lies in the sudden development of uremia, it becomes highly desirable to dilute the toxins circulating in the blood to as great a degree as is consistent with not giving the kidney more water than is possible for it to excrete. This does not mean that very large quantities of water or milk are to be given, but that from one to one and a half litres of milk, enriched with cream, with two or three hundred c.c. of water, may be administered. Such a mixture, with the addition of bread and the various carbohydrate cereals and butter, can be very easily made to cover all the caloric needs of the body. The strictest parallelism should be observed between the fluid intake and the output through the kidneys, the quantity being increased gradually as the secretion of urine increases, the pulse tension being carefully watched the while. Recently experimental evidence has been forthcoming which lends support to this plan of procedure, at least so far as the second group of cases is concerned. Mohr and Dapper found that in acute nephritis, as well as in the contracted kidney, limitation of the fluid under 1,250 c.c. produced a retention of nitrogenous substances and phosphoric acid, whereas when more than 1,500 c.c. were administered these were not seriously affected. Klaus, Hanssen and Gröndahl (quoted from Strauss) made a series of experiments in which they kept the caloric value of the food content, varying the amount of water. Their analyses were such as to lead them to the opinion that the restriction of water would impair the elimination of the products of metabolism. Strauss found that when he poisoned

rabbits with uranium those that lived longest had not only more interstitial fluid but also dropsy in the body cavities. He considers, therefore, that dropsy is in one sense a compensatory process, in that it diminishes the toxic action of the retained products of metabolism. He regards an uremia with dropsy as preferable to an uremia without dropsy. In the convalescence of cases of this sort where, as is pretty well known to clinicians, the diuresis is exceedingly free, or, in other words, where the kidney has regained its power, in a great measure, to excrete water, rational therapy dictates that water should be freely administered, without there being the least necessity, either theoretical or practical, for giving the excessive amounts of water sometimes prescribed.

The next group of cases to be considered are those acute or sub-acute cases which become chronic, or which, as in a number of instances that have come under my observation, last many months, so that the question of keeping up the nutrition becomes one of paramount importance. These cases, which are not so rare as commonly supposed, may be considered, from the standpoint of therapy, in the same light as cases of chronic parenchymatous nephritis. In my experience these cases are extremely difficult to handle satisfactorily, as the edema is apt to be of a high grade, difficult to get rid of, and at the same time not infrequently uremic symptoms, especially of the milder grades, are likely to appear at almost any moment. This applies particularly to the gastrointestinal uremic symptoms. The quantity of fluid to be permitted under these circumstances must be judged on broad clinical grounds. With a moderate excretion of urine, say five or six hundred c.c., and with the existence of edema and, at the same time, of uremic symptoms, scarcely any plan can be devised which is not open to criticism in some points. In my experience the factors which are most satisfactory in determining the amount of fluid to be allowed are the severity of the uremic symptoms, the pulse tension and the condition of the heart and arteries. Edema, unless excessive and involving the serous cavities, is, as compared with the symptoms just mentioned, of less grave import. Under these circumstances, when the pulse tension is not exceedingly high, the administration of rather small quantities of water at short intervals, being guided by the effect upon the tension, is probably the method which is open to the fewest objections. The edema is generally a true nephritic edema, and not due to failing cardiac compensation. That it is due in part to the inability of the kidney to excrete chlorids, and to the rejection of these into the interstitial tissues, has already been mentioned. Comparing systematically the intake of fluids with the daily quantity of urine and, when possible, by daily accurate weighing of the patient, we may, by feeling our way, determine the quantity of water which best suits the individual case. Acute exacerbations, often of a hemorrhagic type, are to be treated as an acute nephritis. Some of these cases gradually take on the type of the contracted kidney after having lasted a year or more, and may be treated as such.

In the genuine contracted kidney the conditions are so different that our governing principles must be greatly modified. Here we are con-

fronted by a disease which lasts often many years, the patient meanwhile in apparently robust health, yet in this interstitial form death ensues almost as often from cardiac failure and the accidents incident to high-pulse tension, as from the failure of the kidneys themselves. With the pulse tension almost invariably high, and arteries quite commonly stiff and rigid, the first question to be solved is as to the effect of the ingestion of water upon the heart. There can scarcely be a doubt that the enormous quantities of water frequently taken by patients, both at home and at health resorts, are often productive of cardiac breakdown. I have in mind two cases where middle-aged men, in whom the contracted kidney had been accidently discovered, were made immeasurably worse by the advice of their physician to drink such large quantities of water as that the urine increased to about three times the previous quantity. Both cases were promptly benefited by a temporary reduction of the fluid intake to a minimum. Nothwithstanding such cases as these, in which I think everyone of considerable experience would agree as to the proper course to pursue, I believe it is wrong to limit the fluids greatly in all cases of contracted kidney, especially in the light of the researches of Mohr and Dapper. My own plan of procedure has been as follows: If there are no evidences of decomposition and no considerable arteriosclerosis, water is given tentatively,, estimating the pulse tension immediately before and at frequent intervals afterward. In this way it can be determined just how much can be taken without increasing the tension materially. In a moderate experience with this procedure, which coincides fairly well with that of Strauss, I have found that larger amounts of fluid could be given than one would, *a priori,* suppose. With uremia threatening and the heart still in good condition it would be quite proper to risk considerable quantities of fluid. The first sign of decompensation, either swelling and tenderness over the liver as result of its engorgement, or edema over the ankles, should be met by a prompt diminution in the amount of fluid, even down to almost none at all for twenty-four hours. It would seem hardly necessary to call attention to the fact that it is the height of folly to administer very large quantities of water, then to order sweat baths and purging to help eliminate it, the more so as we have no reliable evidenee indicative of the power of the skin to excrete toxic substances. My experience with sweating procedures is that they are exceedingly weakening to the circulation and accomplish nothing in the way of diminishing the uremic symptoms. These points are familiar since von Noorden's work on the subject appeared.

To sum up, it would seem that the restriction of the total fluids, below 1,500 c.c., exclusive of the amount contained in the food, may be quite as injurious as the excessive quantities formerly prescribed. In my judgment, when the extensive edema finally occurs in the contracted kidney, it is to all intents and purposes a cardiac edema and should be treated primarily as such. Finally, the entire subject of the treatment of nephritis, and more particularly as it applies to the factors under discussion, is essentially one of individualization and not of glittering generalities. The firm ground of broad clinical experience must decide in each particular individual as to what is the appropriate therapy.

DISCUSSION ON THE PAPERS OF DRS. ELLIOTT, CROFTON AND WILLIAMSON.

Dr. James B. Herrick, of Chicago:—Mr. President: So many points have been touched on in these three papers—and in my judgment they are most excellent papers in every sense—that it would be impossible to discuss them all.

With regard to albuminuria and casts, and their significance, we should, as Dr. Elliott has said, look upon albumin and casts as always pathologic, but not necessarily as indicating disease of the kidney; or as indicating that the disease of the kidney, even though it be present, is serious. There is a tendency for us either to overestimate, as was done several years ago, or to underestimate the importance of a trace of albumin and the finding of a few casts in the urine, a tendency not infrequently seen to-day. We are perhaps inclined to overestimate their importance and condemn a man to Bright's disease when we find a trace of albumin or a few casts in the urine, overlooking the fact that these things may be merely significant of the approach of age. With the electric centrifuge casts are found in the urine of nearly every individual over the age of forty or forty-five. A trace of albumin may be found under various circumstances, which are really not of much importance. The only way we can rightly estimate such findings in the urine is, as Dr. Williamson says, to individualize, and not to dogmatize or estimate on the basis of any hard and fast rule. In other words, we must study the patient as a whole, and when we find albumin and casts in the urine we should look upon them as something that needs careful investigation. In one case we may find no other evidence of nephritis; no cardiovascular changes; no anemia; no retinal changes; nothing which can be looked upon as uremic intoxication; while in another case, with no more albumin, no greater number of casts, we may put a serious interpretation on it because we find deterioration of the blood, loss of weight, urinous odor to the breath, and definite cardiovascular changes.

Dr. Elliott referred to a point I think we often overlook, and that is the cyclic appearance of albumin in the urine during convalescence from acute nephritis. It is sometimes rather puzzling to find a patient with what resembles a cyclic albuminuria; he is too old, perhaps, for the ordinary albuminuria of adolescence, and we are at a loss to understand why we find albumin to-day and none to-morrow. Possibly in many of these cases, certainly in some, if we had the past history, we should find these patients just convalescing from an acute nephritis. The tendency has been of late for teachers to emphasize so strongly the occurrence of cardiovascular changes in nephritis that physicians and students look askance when a diagnosis of nephritis is made in which these changes are not marked. But there are many cases of nephritis in which cardiovascular changes do not occur. They are not made out during life nor are they found post-mortem.

Perhaps it is not necessary to emphasize Dr. Williamson's protest against a too strict adherence to a milk diet, and yet we find to-day very often the moment nephritis is diagnosed, no matter what the individual characteristics of the disease may be, the patient is at once put upon a milk diet, and nothing else is given for weeks, and, as I have known, in some cases, for months. There is certainly harm in this, and to feed a patient *ad nauseam* with milk three, four or six times a day, not only destroys the appetite, but the patient acquires a loathing for the milk, certain digestive disturbances are almost certain to arise, and we find oftentimes diarrhea, anorexia, with coated tongue, loss of weight, and anemia. We must very often violate the old rule and say to the patient, "What you need is milk, to be sure; but take a little something more; take cereals; take fruit, and you may even take red meat in moderation." That, of course, is looked upon with horrer by most of the laity, because red meat has been regarded as absolutely poisonous for the nephritic. While milk is our sheet anchor in the way of diet in nephritis, it should not be used except with care, and should not be used to the exclusion of other foods.

There is a great deal that can be said on the subject of methods of reducing blood pressure. Dr. Croftan brought out a good point, that in cases of nephritis we sometimes desire to maintain a high blood pressure. This assumes, in a cer-

tain sense, that high blood pressure is compensatory. We are too often inclined, the moment we get hold of a case of chronic nephritis and find a blood pressure of 180 or 200, to resort to measures that shall reduce the blood pressure. Oftentimes that is not necessary. At other times it is wise to do it; a terrific splitting headache or dizziness and vomiting may disappear under nitrites or nitroglycerin, or by some measures which will reduce blood pressure. But in some instances, particularly in those in which so-called cardiac asthma has begun to make its appearance, and in which we have reason to think there is beginning paroxysmal failure of compensation on part of the heart, we get far better results by giving remedies which really raise blood pressure than we do by measures that lower it. And here, again, is an illustration of what Dr. Williamson says, namely, we must individualize in our treatment of nephritis.

Just a word regarding one or two ways in which blood pressure can be reduced. The one that seems to me of extreme value in many instances is that by rest and a very sharp restriction as to the amount, as well as quality, of food. We often find it practically impossible to reduce blood pressure by means of remedial agents, but if we can put the patient to bed, see that the bowels are kept open, and keep him upon a diet whereby he is almost starved, we may find that not only is he symptomatically better, but by measuring the blood pressure we find it has been actually lowered. Quite remarkable improvement has been brought about by quacks or semi-quacks by employing some such treatment. The secret of such success is that they practically starve their patients. They do not overload the blood vessels. The patient is quiet, elimination is properly carried on, no salt goes into the food, and at times there is improvement that is little short of startling.

If time permitted, one might speak of the value of morphin in some of these cases, and of the great good in the way of temporary relief to be obtained from blood-letting. A good, liberal bleeding will oftentimes lower the pulse for the time being, and it may be repeated at long intervals, and oftentimes with benefit. I am sure, too, that in some cases of chronic interstitial nephritis, particularly those accompanied by marked arteriosclerotic changes, where the arteriosclerosis has been primary and the renal changes secondary, I have seen most excellent results from the use of potassium iodid, given in small doses, and continued for a long period of time. And yet, with all that has been said, I think we should conclude that the last word has not yet been uttered, either as to the significance of albumin and casts in the urine or as to the cause of cardiovascular changes, or as to the best method of treatment. We all of us formulate certain theories in our studies and in our discussions, but when we put them into practice we modify them by our individual experiences; and we have, as we go on in practice, a mingling of that which is theoretical and of that which is practical, and when we try to formulate our ideas into definite rules for the guidance of others we find these rules are not quite as accurate as we wished they might be, and that there is a great deal yet to be learned about nephritis, both theoretically and practically.

Dr. Everett J. Brown, of Decatur: These papers are interesting to general practitioners. A few years ago von Noorden made a statement to this effect, that there were three elements which a diseased kidney could not eliminate, namely, urea, salt, and water. This statement was so iconoclastic and so different from what we had been taught with regard to flooding the system with water in nephritis that it set us all to thinking, and I have read all I could upon this subject and have endeavored to carry out in my practice a great many of the points I learned from von Noorden. Of course, a milk diet is unpleasant, and von Noorden has endeavored, by means of adding one-third cream to his milk mixture, to lessen the amount of water, at the same time affording enough nutrition. I have under observation a remarkable case of chronic parenchymatous nephritis, the patient having come to me with albuminuric retinitis of such marked degree that the amblyopia was almost complete. He could not read newspapers and could barely see to walk around the house. My prognosis was unfavorable. I put him under treatment with a milk, vegetable and fruit diet. I told him he could eat

anything that came out of the ground. I caused a two-thirds reduction in his salt intake. I was surprised at the ease with which he took this diet, which reduced the salt, because it was meat that required salt, and was surprised to notice the remarkable improvement in his eyesight. Now he is able to read the morning papers, and walks without difficulty. I regard this improvement, however, as being temporary. We sometimes are astonished at the length of time our nephritics live. I recall the case of a man who had chronic parenchymatous nephritis, eight years ago, who had universal anasarca, but who is now well and is running a store. He ascribes his cure to a six years' course of urotropin, of which he took seven and a half grains three times a day for that period. I do not believe the urotropin had much to do with effecting the improvement, but he took the treatment recommended for him, and the result has been remarkable in regard to the length of time the man has lived.

Dr. H. J. Stewart, of Chicago:—I wish to speak of one point in connection with these papers, namely, of indican in the urine. I believe in cases of chronic interstitial nephritis more attention should be paid to the action of indican in the urine than formerly. We all know that indican is the result of an intestinal putrefaction, and it occurs to me that probably its presence means an increasing toxemia putting an extra load or irritaating these already sick kidneys and may be a large factor in causing those dreadful symptoms or conditions such as uremia or retinitis, and even going farther back. I question if it does not have a far greater part than we have heretofore thought in causing the original nephritis. I have noticed that none of the gentlemen taking part in this symposium have touched on this matter at all. I was called to see a case recently; a woman, aged 25 years, who discovered that her eyesight had almost gone over night. I immediately examined her urine and found only the slightest trace of albumin, no casts, but an abundance of indican. The clinical findings led me to believe that this indican appearing in her urine, the result of an intestinal putrefaction, must be a factor in her eye conditions, therefore, I immediately set about removing the cause of this reaction and she improved very much the second day and has continued to improve every day since. I would like to hear what views the gentlemen have on this condition, as to whether they think it plays as important a part as I think it does or if it plays any part at all in nephritis.

Dr. A. Belcham Keyes, of Chicago:—I have listened to these papers with extreme pleasure. In work upon the peritoneum one often has cases of peritonitis in which there is an enormous absorption of toxins from the peritoneal cavity. We are forced to try to maintain localization of this peritonitic process by opiates after operation and drainage which stop peristalsis and elimination via the intestines. In such cases it is very necessary that the kidneys carry on their function of elimination to the utmost. Very many times we find both albumin and casts in the urine from the autointoxication. I feel that there is a dearth of data to guide us as to what we are to feed such patients in order to get the best kidney excretion. For years I have used peptonized milk, which was not mentioned by the essayist. I would like to know Dr. Williamson's opinion of this. In some of our cases the casts and albuminuria may have existed for a long period or they may be purely febrile and transitory. In either case, as we cannot eliminate by the bowels, all of the toxins must be eliminated by the kidneys or skin, making it a question of importance to every operator to give his best attention to the feeding of such cases.

Dr. Robert H. Babcock, of Chicago:—There are three points of an empirical nature to which I should like to refer in this matter of the treatment of edema in chronic nephritis. 1. If any one has seen many cases with edema he knows that some of the edemas are hard and some are soft. Although one should estimate the volume of chlorids in the urine in all cases of nephritis or of cardiac disease showing dropsy, still in a purely empirical or rough clinical fashion considerable information may be obtained from determining this character of the edema as to the value of restricting or entirely eliminating the salt from the dietary. If the edema is soft, the restriction or total deprivation of salt from the

food will usually prove most effective in its removal. In the hard edemas, on the other hand, a dechloridation of the diet is, in my experience, of small value. 2. In many cases of chronic nephritis with perhaps but slight edema we see patients who suffer a good deal from dyspnea, a sort of paroxysmal dyspnea. In some of them the heart does not seem much at fault, and it is sometimes difficult to determine the cause of the dyspnea, unless it be looked upon as toxic or due to retention of some product that should be eliminated or possibly to an internal edema, as, for instance, of the lung tissue. In some of these cases it has been my experience that a salt-free diet is most happy in its effect, that is, in relieving the dyspnea. 3. In any case of chronic nephritis in which edema is not present I believe it is a good plan in their management to teach the patients that they must cut down their intake of salt lest the time may come when the retention of salt in the tissues will occasion edema.

Dr. Arthur R. Ellliott, of Chicago:—Dr. Herrick has referred to the albuminuria of convalescence. That is a very interesting and inconstant form of albuminuria, which I have quite often observed. It has seemed to me in certain cases that it was of the same pathogenesis as the albuminuria of adolescence or so-called orthostatic albuminuria, and is due to a lack of vasomotor control of the glomerular circulation resulting from the long recumbency of the preceding illness. With regard to the control of high blood pressure, I regret that Dr. Preble is not here to-day, because I think this is one of the live subjects in the therapy or treatment of Bright's disease. Very radically different views obtain as to the desirability of tampering with the element of high blood pressure. There are those who hold that high blood pressure is a compensatory mechanism, and would leave it alone except in the presence of definite indications; while there are others who advocate the employment of vasodilator methods directed towards the control of the high blood pressure. Of the physiologic therapy we employ in cases of Bright's disease for controlling high blood pressure, such as diet, rest, change of scene, change of environment, hygienic treatment generally, there is perhaps no one thing so useful as the morning purge. There comes up the question of whether we shall employ vasodilators, and I am one of those who believe in the employment of vasodilator medication under certain conditions. I believe in the employment of vasodilator medication we should be guided by certain definite rules. If the blood pressure reaches above two hundred I give vasodilators, as a rule I do not always succeed in lowering blood pressure, but that is not necessary to benefit the patient's symptoms. Your patient may often experience great subjective benefit from the employment of vasodilators without the instrument showing the slightest variation in the downward direction. Occasionally the employment of vasodilators causes an increase in the blood pressure, although there is an improvement in the patient's well-being. The presence of apoplexy prodromes, headaches, dizziness, precordial distress, anginoid symptoms, etc., point to the necessity for diminution of blood pressure when it is high. There are certain cases of contracted kidney which can be greatly benefited throughout their course by the use of vasodilator medication.

Dr. Williamson (closing the discussion):—In regard to the question propounded by Dr. Keyes concerning what may be done in the way of feeding patients in whom, after operative conditions on the peritoneum, there is absorption of toxic material from that membrane, and, at the same time, it is imperative to maintain the bowels in a state of absolute rest by giving them opiates, I am not at all sure that I am competent to answer the question, not being a surgeon. But it occurs to me, the wisest way would be to limit strictly the ingestion of food, to give the smallest amount of food consistent with the maintenance of an adequate degree of nourishment, and the exhibition of small quantities of water at frequent intervals. One should limit the food to such quantities as will put no additional weight on the kidneys. Such a condition of affairs would only last a few days, and the cutting off of food would not be a serious matter. That would be my thought in regard to the matter.

FRACTURE OF PELVIS AND RUPTURE OF BLADDER.*

E. K. Lockwood, M.D.
VIRDEN.

I have selected this subject, "Fracture of Pelvis and Rupture of Bladder," because it is a very common injury through the central and southern part of this state, where there are so many coal mines. This injury occurs usually among coal miners, and especially among drivers. I have seen four cases in the last four years in a town that has from fifteen hundred to two thousand miners. This injury occurs usually from being caught between coal cars and squeezed, or squeezed and rolled, but it may be caused by any force strong enough that is applied to the pelvis. One of two things will occur, depending on the age. Those under 20 usually have separation of the symphysis pubis with over-riding of the bones; also separation of the sacro-iliac articulation and rupture of the bladder; while those over 20 have a green stick fracture of the ascending ramus of the ischium or descending ramus of the pubis with rupture of the bladder. This rupture of the bladder is, in a great majority of cases, extra-peritoneal and the rent is in the region of the trigone. The symptoms and signs of this injury are classical, and I will give them in the order in which they will be observed and according to their importance. Shock is always present and it varies in degree owing to the extent of injury. In Case 1 it was profound, while in Case 4 it was slight. Constant desire to urinate, with inability to pass even a few drops, is always present. On passing the catheter you succeed in drawing off a few ounces of bloody urine. It may be nearly pure blood. By examination per rectum you will feel that there is a difference in contour on the two sides of the pelvis, the side of the fracture feeling fuller than the corresponding side.

I think with these symptoms and signs present one can feel positive of fracture of the pelvis with injury to the bladder, but after twelve to twenty-four hours there will be a dulness in the flanks, due to extravasation of urine, which may extend as high as the umbilicus, also ecchymosis of the scrotum and perineum.

The mortality due to such injuries will vary according to the extent of injury and the treatment. Von Bergman gives 75 per cent. mortality in cases that were not operated on, while cases operated on had a mortality of 50 per cent. In our four cases those that were operated on lived; recoveries, 100 per cent.; while those cases we did not operate on died; mortality, 100 per cent.

The treatment is operative; suprapubic incision down to the bladder. Be careful not to open the peritoneal cavity and if possible repair rent in bladder, but if impossible open the bladder and place in drainage. (In Case 3 the patient's condition was so desperate that we placed drainage in the region of the bladder rent and packed off Retzius' space). Retention catheter is inserted for a few days, and the question will come up,

* Read at the Fifty-ninth annual meeting of the Illinois State Medical Society, Quincy, May 19, 1909.

Shall we wait until shock is over? I think not. Shock continues as long as urine is extravasated into the tissues, probably due to stretching of nerves, and we have noticed that within half an hour before operating the patient began to recover from shock. *Asepsis, of course, is very important.*

CASE 1.—J. V., male, aged about 28 years, caught between cars at 7 a. m. Seen at 8 a. m. He was collapsed; pulse, 150; bruise on back. Passed catheter and drew one pint of bloody urine; injected boric acid solution. All returned. Frequent desire to urinate, with inability to pass even a few drops. A pear-shaped tumor in hypogastric region the size of a child's head; abdominal muscles rigid; pain below umbilicus of lancinating character. Patient died at 8 p. m. Post-mortem: Rupture of the bladder the size of the palm of the hand in the region of the trigone with fracture of the ascending ramus of ischium on both sides; considerable urine in Retzius' space; large hematoma in hypogastric region.

CASE 2.—Johnson, a driver, male, aged 17 years; squeezed between cars. Considerable shock; constant desire to urinate but could not. Passed catheter and drew off bloody urine. In two or three days urine was clear; complained of pain in region of bladder; condition grew worse. Patient died on the fourth day. Post-mortem: Separation of pubic articulation with over-riding; some extravasation of urine as high as umbilicus; rupture of bladder in region of trigone. Assistant caught one side of ramus of pubic and myself the opposite side, but could not reduce fracture or dislocation; then tried to pry between articular end of pubic bone with no better result.

CASE 3.—February 13, 1908, E. K., driver, male, aged 17 years; injured about 2 p. m.; kicked by a mule; does not know what happened. Saw him at 5 p. m.; he complained of pain over bladder and in back; constant desire to urinate, but not able to pass any urine; said that was all that bothered him; shock extreme; abdominal muscles tense and boardy; dullness over region of bladder shading into resonance above; depression over pubic bone on left as compared to right. Passed catheter and drew off two ounces of bloody urine.

Operation 23 hours later. Condition at time was alarming; shock still present; pulse 130 and weak. Incision over region of bladder; about one quart of urine escaped; pubis articulation had separated and was riding under bone of right side. Assistant caught ramus of pubis on one side and operator caught opposite, but could not reduce dislocation. Rent in bladder was in region of trigone; could not sew same on account of location, so placed in drainage tube and packed Retzius' space; placed in retention catheter. Patient recovered. Present condition July 28th; left foot turns out and he has a limp, but no trouble with bladder in any way. Condition is good.

CASE 4.—R., Italian, male, aged 34 years, squeezed between cars; shock, and constant desire to urinate but could not pass any urine. Examination per rectum: Could feel a distinct fulness on left side of pelvic bone in region of ramus of ischium. We took patient to hospital; operation 7 p. m.; suprapubic cystotomy; patient at time was suffering from shock, but within thirty minutes after operation began to recover from shock. Placed in drainage; could feel fracture of ramus of ischium. Present condition of the patient: left foot turns out, bladder wound healed. He also had rupture of the deep urethra which we repaired about three weeks later. I am indebted to my friends, Drs. Morgan and Matley, for permission to report Cases 2 and 4.

DISCUSSION ON THE PAPERS OF DRS. RYAN, LOCKWOOD AND FULLER.

Dr. Thomas J. Sullivan, of Chicago:—I am sorry I was not present to hear the first paper presented by Dr. Ryan. However, I heard the other two papers. Fracture of the pelvis is an injury that is not infrequently received by men who are engaged in mining and other occupations, where there is danger of crushing of

the pelvis; also when a man riding horseback is thrown and rolled beneath by the horse, fracture of the pelvis almost invariably occurs. In the short time at my disposal it is impossible to go into these points fully. In all supposed injuries of the pelvis the first and necessary thing to do is to pass a catheter; being unable to do so and finding blood passing from the urethra, there is rupture of the urethra to begin with, and possibly rupture of the bladder. That should be determined as soon as possible after the injury, disregarding shock that has very little to do with some of the cases. If the case does not show shock, at the first signs of blood pass the catheter, and prepare for operation, and this operation consists essentially in determining the nature of the injury. If possible, have a skiagraph made. Make an incision in the median line down to the urethra; or, first, if there is a possible chance of rupture of the bladder, make a suprapubic incision which will determine the conditions of the bladder. Also, the pelvis can be palpated through that incision without opening into the peritoneal cavity. The next incision should be made down through the median line to the urethra. Determine the location of the urethra, open in, reach the bladder by the median incision and provide drainage. There is great danger of urinary extravasation and all the terrible things that follow that. If drainage is provided for in a proper manner, there is very little danger to the patient. The cases in which recovery ensues owe it to early recognition of the injury and primarily to early operation. If these cases are not operated on they all die. Fracture of the pelvis is interesting, inasmuch as it shows what an important part the anatomy of the hip joint plays in reducing this dislocation. Many years ago Bigelow pointed out the very great and essential part the Y-ligament plays in dislocations of the hip, stating that the Y-ligament alone is responsible for position and reduction of the dislocated hip, and this fracture and dislocation are, in a great measure, a dislocation of the hip. The writer in this case failed to reduce his dislocation until he had taken into consideration the Y-ligament, that is, the thickened anterior portion of the capsule, and he only succeeeded when he brought the leg up to a right angle and made adduction, the very thing Bigelow pointed out as absolutely necessary to reduce a dislocation of the hip. In that case he succeeded when he made flexion and adduction, and then traction. It would seem as though it plays an important part just as it does in the ordinary dislocations.

Dr. Arthur Dean Bevan, of Chicago:—I should like very briefly, in connection with the subject of fracture of the pelvis, with injury of the bladder, to refer to a case which I have had recently in my service, which, I think, presented several points of great interest from the standpoint of cure in some of these difficult cases. A man was crushed about fourteen months before I saw him. He had a fracture of the pelvis which tore through the urethra and into the rectum. He was in competent hands in a small country town. where there was no hospital with modern facilities however, and he was kept there for fourteen months. The injury was one in which there was a tear of about two inches in the rectum at the time of the original injury, with the urethra completely separated just in front of the prostate from the triangular ligament, so that when one passed a sound into the bladder, and then put a finger into the rectum, he could feel the sound for about two inches in the rectum. He was kept alive practically by having suprapubic drainage and a tube introduced into the urethra. When I saw him he had these conditions: A suprapubic fistula; a stone in the bladder; an opening leading from the urethra into the rectum. He had four fistulous tracts leading from the injury of the urethra and the rectum into the perineum, and one under the thigh. I want especially to emphasize the method of treating these fistulæ between the urethra and the rectum or between the bladder and the rectum. (Here Dr. Bevan drew a diagram showing the operation he had done in this case.) I do not know that this exact method was ever used before. For instance, this is the sacrum (indicating), and here is the symphysis. We had to deal with such a problem as this: Here is the rectum, here is the bladder, the

prostate is at this point (indicating), and the urethra is here. Of course, this is crudely diagrammatic. We had here a large opening leading from the urethra into the rectum at that point (illustrating). The question was how to cure that opening and how to close that fistula? The method employed was a good deal the same as in inverting the stump of the appendix. A dissection was made around this opening, so that a cuff was turned into the torn urethra, after lifting up this flap, with pursestring suture. We could then turn our flap into the urethra by the pursestring suture in this way (indicating); that left the rectum at this point, which was slid over and brought down to the margin of the anus, this point being brought down and covered in in that way. The same method was utilized in curing a fistula in the pendulous urethra. For instance, in the pendulous urethra there was a long fistula running in front of the injury. This was dissected out, just like a pipe-stem, from the surrounding tissue, and turned in as we would invaginate the appendix, the major portion being cut off. In two such cases we had the satisfaction of having primary union. I make this brief statement to report that little point in technic in curing this fistula after fractures of the pelvis. We established drainage through the suprapubic opening. There was a large stone, which we removed through a suprapubic opening.

Dr. Collins:—What suture material was used?

Dr. Bevan:—Catgut, all the sutures being buried.

Dr. J. L. Wiggins, of East St. Louis:—I can heartily coincide with the deductions of Dr. Sullivan relative to there being practically no mortality in these cases conditional upon the early interference. That has been my experience in some four or five cases which have come to my service. And there is another surprising feature about it, and that is, it does not require men of extraordinary skill or knowledge to get beneficial results in these cases, provided they are taken early. A lesson I have learned from my own experience in these cases is that in every instance it is much better not to depend upon the perineal incision. In most of these cases in which there is rupture of the bladder we often find there is also rupture of the urethra, and if we make a suprapubic incision the conditions are much better handled. It is much safer in every respect; there is much less damage done to the soft parts, with possibly one-half less work, or with one-half of the groping in the dark to locate the injuries, and the results are always better. It is the experience of the majority of operators who have handled this class of cases that an early operation, almost an immediate operation, irrespective of shock, dependent upon wide injury, gives the best results.

Dr. Fuller (closing the discussion on his part):—I have nothing further to add except to reply to one point made in the discussion about immediate operation on patients who are in shock. If I understood one of the previous speakers he said he would operate immediately regardless of the degree of shock. To operate on any patient in great or even moderate shock is to lessen his chances of recovery. If his depression or lowered vital state is due to hemorrhage, a condition sometimes regarded as shock, then the indications are different, and radical treatment is called for. In true shock, however, measures to combat this condition are imperative and should always be instituted before any operation is performed.

Dr. Lockwood (closing the discussion):—I would like to say in reference to the remarks made by Dr. Fuller, in Case 3, the patient was in extreme shock, and we waited fully eighteen hours to see if he would recover from the shock. But he seemed to grow worse instead of better; then we operated, and the man in one hour recovered from shock. In Case 4 we only waited three or four hours, and one hour after operation the patient had recovered from shock due to the injury.

THE DIAGNOSIS AND TREATMENT OF STONE IN THE URETER.*

ARTHUR DEAN BEVAN, M.D.
CHICAGO

AND

HERMAN L. KRETSCHMER, M.D.
CHICAGO.

This paper will be limited to the consideration of the *x*-ray diagnosis and the treatment of stone in the ureter. Diagnosis being so important in this group of cases, it is but natural to find various methods of diagnosis described in the literature; these various methods are very frequently referred to by those writing on this subject; still the number of cases reported in which an exact and positive diagnosis has been made with the aid of one of these methods are very few. It appears justifiable, therefore, to report the below mentioned case. The subject of diagnosis of stone in the ureter must naturally be considered under two separate headings, namely, the probable diagnosis and the positive diagnosis. By a probable diagnosis is meant a diagnosis based upon the history as elicited from the patient, together with the physical findings and the result of repeated and careful urinary examinations. This diagnosis may be made with a certain feeling of surety when the patient gives a definite history of having had a ureteral colic, if either blood or pus, or perhaps both, are found in the urine, together with pain or tenderness along the course of the ureter upon palpation. The question of diagnosis is a much more difficult problem in those cases giving a history of vague and indefinite pains in the abdomen, instead of a typical history of renal or ureteral colic, and, added to this, indistinct urinary findings, as may be the case where the patient presents himself for diagnosis in the free interval; that is, between two attacks of colic. In this class of cases an *x*-ray picture should be taken, not only of the kidney on the suspected side, but of the entire ureter on that side, as well as of the kidney and ureter on the opposite side, so as to be perfectly familiar with the opposite side. After the patient has had a renal colic, the stone may have started on its journey down the ureter, so that an *x*-ray of the kidney and upper ureter would be negative, and the stone might easily be overlooked on account of its low position in the ureter, below the brim of the pelvis. In these doubtful cases an *x*-ray picture may clear up the entire question of diagnosis, and, on the other hand, it not infrequently happens that the Roentgenogram fails to be of any aid whatsoever, for it not infrequently may show the presence of indefinite shadows in the pelvis, apparently along the course of the ureter, thereby tending to obscure the diagnosis still more.

It is not the cases in which a large stone or stones are present that give rise to difficulties in diagnosis, as, for example, the case of Federoff,

* Read at the Fifty-ninth annual session of the Illinois State Medical Society, Quincy, May 18, 1909.

who was able to palpate the entire ureter filled with calculi, before the operation; but it is that group of cases giving an indefinite history of pain, etc., and in which either a small stone is present that cannot be palpated or in those cases showing an "indefinite shadow" on the *x*-ray plate. These so-called "indefinite shadows" were the cause of much speculation in the earlier operative treatment of ureteral stone, so that not infrequently, after having obtained an *x*-ray picture showing a pelvic shadow, it was looked upon as a stone in the ureter and its operative removal was undertaken. In some of these cases a stone, to be sure, was found and removed. On the other hand, however, and in a fair number of cases, it happened that no stone was found at the time of operation. It was then that attention was drawn to the fact that these shadows were produced by bodies outside of the ureter. (Extra-ureteral origin of the shadows). These pelvic shadows are seen more and more frequently, due on the one hand to an increasing number of pelvic pictures that are being taken, as well as to the improved technic in taking the pictures, so that there are undoubtedly a good many of these shadows shown on the plates that were not recognized formerly. In seeking an explanation for these pelvic shadows we must bear in mind the many anatomic structures that are found in the pelvis, and hence it is but natural to expect that more than one explanation is possible for them.

In the following case the first *x*-ray picture showed the presence of a shadow that suggested the possibility of a stone in the ureter. After passing a ureteral catheter armed with lead wire, a second *x*-ray picture was taken, which showed the presence of the stone within the lumen of the ureter. This was verified by the operative removal of the stone by Dr. Bevan.

The patient, M. A., case No. 50,527, a male, aged 52 years, entered the service of Dr. Arthur Dean Bevan at the Presbyterian Hospital December 5, 1908.

Present Illness.—Patient states that four years ago he first noticed disturbances in micturition. At this time he was unable to void urine for a long time, and at other times he would have attacks of frequency of urination; during these attacks of frequency of urination he would pass very small amounts of urine. About the same time patient had severe abdominal pain in the left lower quadrant of the abdomen. The pain would last for three to four hours and then pass away very suddenly. Patient does not remember whether or not he passed large quantities of urine after these attacks of pain. During the attacks of pain he would feel nauseated, but he never vomited. Patient says that his urine was turbid during these attacks. For the past eleven months the patient has felt a pain or discomfort in the lower left quadrant of the abdomen, and when the pain was severe it would radiate toward the kidney and the bladder. At irregular periods he would have exacerbations similar to his first attack. The pain has been relieved by the use of some anodyne. The patient has not lost weight and has been able to work most of the time.

Previous History.—Negative.

Family History.—Negative.

Habits.—Smokes and drinks moderately. Appetite good. Bowels regular, except when he has these attacks of pain. Weighs about 150 pounds.

Examination.—Patient walked into the hospital in apparently good health—not emaciated. Color fair. Head, neck and scalp, negative; glands, not palpable; thyroid, not enlarged; tongue, not coated; teeth, fair; eyes, pupils react to light and

accommodation and they are equally dilated. Chest: Ribs prominent; expansion good; lungs, negative; heart, normal borders, no abnormal tones. Abdomen: The abdominal walls are very thick. No tenderness over kidneys or bladder. Some tenderness may be elicited in the left lower quadrant of the abdomen upon firm pressure, which is not very severe or localized to any special point. The rectal examination was negative. Blood examination: Hemoglobin, 93 per cent.; leucocytes, 8,350. Urinary report: Color, red; physical condition, turbid; specific gravity, 1.020; sediment, no casts found; epithelial cells present; leucocytes present; erythrocytes present. Cystoscopic examination: This shows a slight amount of injection of the vessels of the trigone. Internal urethral orifice is normal. Both ureteral orifices slit-like. Ureteral catheterization: On account of the location of the pain on the left side and owing to the fact that the suspicious shadow was found on the left side, it was decided to catheterize the left ureter only. For this purpose a ureteral catheter armed with fuse wire was used and passed into the pelvis of the kidney. At this place it might be well to consider the question of obstruction offered to the ureteral catheter by the stone. The catheter passed freely up into the pelvis of the kidney and no impression of obstruction to the catheter was noticed during its introduction.[1]

X-ray Examination.—This was made by Dr. Hollis Potter, and verifies the probable diagnosis of stone, made before the introduction of the lead wire. Upon examining the skiagram (Fig. 1) the entire course of the ureter can be seen, and in its course the shadow produced by the stone. Almost the entire shadow produced by the stone can be seen lying internal to the shadow of the wire. *The entire procedure was carried out during Dr. Bevan's clinic at Rush Medical College, so that after the catheter was passed and the picture taken and developed, the patient was prepared for operation in the clinic.*

Operation (Dr. Arthur Dean Bevan).—Ether anesthesia, drop method. The extraperitoneal route was the one used to approach the ureter, using the same incision as that used in ligating the common iliac artery. In this case the lead catheter was not removed after the *x*-ray was taken, so that the lead catheter may be looked upon as an aid in locating the ureter and, secondly, the lead catheter allowed the ureter to be brought well up into the field of operation and of its being more easily held there with small hooks, making the removal of the stone (see Fig. 2, exact size of stone) much easier than if one is working in the bottom of a deep wound, as would have been the case in this patient on account of the thick abdominal wall. The ureter was incised over the stone and the stone removed; the incision in the ureter was closed with a few catgut sutures. No fistula followed the operation. A small cigarette drain was placed down to the ureter. The patient made an uninterrupted recovery, leaving the hospital at the end of two weeks.

The most important question to be determined in these cases showing an indefinite shadow in the pelvis is to determine the relation that exists between the shadow and the lumen of the ureter. In other words, we must determine whether the shadow has an intraureteral or extraureteral origin. This fact may be determined in one of three ways: 1. The passage of an ordinary ureteral catheter armed with "fuse wire." 2. The

1. Not infrequently the statement is made that during the course of an operation on the kidney or ureter, a probe or catheter should be passed through the ureter into the bladder to detect stones in the ureter should they be present. This procedure, if positive, may be of aid in recognizing the presence of a stone or an obstruction; if negative, however, it does not allow of one's positively excluding stones in the ureter, as the stone may offer no obstruction to the passage of the catheter whatsoever, as was the case in this patient, to which fact attention has already been called. The factors leading to error in diagnosis are not always the same in each individual case. The catheter may, for example, catch in a fold of mucosa and thereby produce a false impression of obstruction. On the other hand, the stone may lodge in a pocket of mucosa which has become swollen and edematous, so that the catheter more or less readily glides over the stone.

Figure 1.

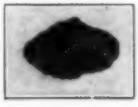

Figure 2.

use of cinnabar catheters. 3. Instead of catheters shadowgraph bougies may be used. Needless to say that no matter which of these methods has been resorted to, another *x*-ray must be taken, or better perhaps, two pictures, one in the anterior-posterior position and a second with the patient partly on the side. One of the most important conditions to be fulfilled is that, no matter which method is used, a good, clear, distinct shadow must be obtained on the *x*-ray plate.

R. Goebell has suggested the addition of cinnabar to the varnish used in coating the ureteral catheter and after the introduction of the catheter to take an *x*-ray picture. It is doubtful whether the picture obtained by this method would be as clear and distinct as is the picture obtained in this case, in which a ureteral catheter armed with fuse wire was used. Shadowgraph bougies are used by Fenwick, and he calls attention to the fact that a marked difference exists in the different kinds that are on the market, in the intensity of their shadow, may of them being exceedingly unreliable.

In 1901 Schmidt and Kolischer suggested the use of lead wire combined with a simultaneous skiagraph, and it is the method that was used in this case. The fuse wire is that used by electricians and can be obtained in any electrical supply depot. Among some of the advantages of this method may be mentioned the very intense shadow produced by the fuse wire. This is a most important factor in determining the relationship existing between the lumen of the ureter and the suspicious shadow. The wire is soft and pliable, and therefore it readily follows the natural course of the ureter without causing any deviation in its anatomical position. This point is illustrated by a reference to Figure 1, which shows a distinct curve in the catheter in that part corresponding to the urethra, and undoubtedly corresponds to the bulbous urethra. The wire can readily be sterilized[2] and can easily be introduced into the lumen of the catheter.

Objections to this method may be offered by those in favor of using the cinnabar catheter, by the use of which the lumen of the catheter is not obstructed, and hence no temporary obstruction to the flow of urine is present. It is a well-known fact that a certain amount of urine flows down the ureter along the side of the catheter, and hence a complete blocking of the urinary flow can hardly take place. This patient never complained of a particle of pain at any time during the entire examination, so that this argument does not hold in this particular case.

"The simplicity of this method, as well as its exactness, is illustrated by the above-mentioned case, in which the entire examination of the patient, including cystoscopy and ureteral catheterization, the x-ray examination and the operative removal of the stone, was carried out during the course of one of Dr. Bevan's regular college clinics."

It is not the object of this paper to consider the use of wax-tipped catheters, as devised by H. Kelly, nor the ureteral catheter recently described by Cunninham, Jr., of Boston.

2. It is of the greatest importance that the rules of surgical asepsis and antisepsis be carried out in this work, just exactly the same as in any other manipulation on the urinary tract; it is necessary, therefore, to have methods at our command that can comply with these demands.

This case can be looked upon as a postive case, since the intraureteral origin of the shadow was demonstrated before operation, this fact being proven by the operative removal of the stone. As negative cases may be named those cases giving shadows leading to a probable diagnosis of stone in the ureter, but in which the shadow was of extraureteral origin, as proven either by the use of lead-wire catheters or by operation. Similar positive cases have been reported by Albers-Schoenberg and by Kuemmell and Graff. In Sick's case, reported by Albers-Schoenberg, a stone shadow can be seen and in direct connection with it the shadow of the lead bougie. The stone in this case was found six cm. above the ureteral orifice "dort wo der ureter die Beckenwand verlassend vom Plexus uterinus umgeben, in dass Parametrium eintritt." In the case of Kuemmell and Graff the *x*-ray shows the ureteral catheter with a wire mandrin passed up to the stone.

Equally interesting are the negative cases; that is, those cases in which a stone in the ureter was suspected but in which the *x*-ray with a lead wire showed the shadow to be due to some causative factor outside the lumen of the ureter. Such cases have been reported by Fenwick, Harris and Reichman. In those cases in which a plain *x*-ray had been taken, without the lead wire, and no stone found at the operation, two possibilities arise for consideration: (1) the stone may have wandered down the ureter and into the bladder, and (2) the shadow may be of extraureteral origin. Various explanations have been given for these shadows and some of the conclusions in regard to their interpretation were reached without an adequate amount of positive proof. In a recent publication Bevan and Smith call attention to the rather frequent occurrence of these shadows, believing that their explanation, as calcified or osseous areas in the pelvic ligaments, is the most probable one. "In examining one hundred plates of adult pelves for various conditions it was found that in 25 per cent. of the plates small, round shadows, varying in size from a BB shot to a pea, occur in the vicinity of the spine of the ischium, frequently bilateral and often multiple. They do not occur in the pelves of children." Phleboliths in the pelvic veins, atheromatous patches in the larger arteries, calcified lymph glands, foreign bodies in the lumen of the intestines, calcified nodules in the seminal vesicles (Bevan) have all been called upon to explain the cause of the shadows. A fecal concretion in the appendix has led to an error in diagnosis; Seelig reports a case in which the *x*-ray led to a diagnosis of stone in the ureter. At the operation no stone was found, but instead an inflamed appendix containing a small concretion. An *x*-ray of the appendix after its removal shows a shadow produced by the concretion.

The question of diagnosis is not an easy problem by any means; it is necessary to exclude lesions of all other pelvic organs in the differential diagnosis, for in one case in which Cospedal removed a calculus from the right ureter, a diagnosis of malignant disease of the ovary had been made. A brief consideration of this subject demonstrates the necessity of determining definitely the nature and the exact location of the "pelvic shadows" before the line of treatment to be carried out in each indi-

vidual case is decided upon. In order to do this it is but necessary to establish the relationship existing between the lumen of the ureter and the shadow on the *x*-ray plate. Various aids in interpreting these shadows have been suggested, as, for example, their size, shape, number and position. While these may be of aid in some cases, they cannot be regarded as infallible, and the statement that the shadow corresponds to the position of the ureter, and hence must be a ureteral calculus, can only be accepted with a certain amount of reserve, for some of the cases in which lead bougies had been passed into the ureter, and then an *x*-ray picture taken, show quite a marked difference in the course of the ureter. In the radiogram in this case it can be seen quite plainly that the ureter makes a wide curve toward the wall of the pelvis, and it is evident, therefore, that a positive diagnosis can only be arrived at by showing the exact relationship that exists between the lumen of the ureter and the suspected shadow, as was done in this case. Not only does this method positively establish the position of the stone, but it also gives us a very definite idea in regard to the size of the stone, so that by comparing the size of the shadow of the stone with that of the fuse wire one could say with a good deal of probability that that particular stone would hardly pass down the ureter, which fact was further testified to by the history of its onset, four years ago, as well as the size of the removed stone. The possibility of pyelography, as devised by Voelcker and Lichtenberg, would hardly come under consideration as an aid in the diagnosis of ureteral stone.

It is well always to bear in mind the possibility of the spontaneous passage of a ureteral stone, and especially if the patient gives a history of having passed one or more calculi at some previous time. As aids in the passage of a stone which becomes arrested in its downward course in some part of the ureter, may be mentioned the use of topical applications to the ureter through a ureteral catheter. These applications may be in the form of local anesthetics, such as sterile solutions of cocain, eucain or alypin, or, on the other hand, the use of lubricants may be resorted to, such as sterile olive oil or almond oil or alboline. This same principle, namely that of lubrication, may be applied to cases of stone in the bladder, provided, of course, the relation between the size of the stone and the lumen of the urethra is such as to make the passage of the stone probable. Such a case came under observation recently at the Presbyterian Hospital. The patient was referred for cystoscopy by Drs. Billings and Bevan. A small stone was found in the bladder; the patient's urethra was of large caliber. It was suggested that the patient urinate, and that after this half an ounce of warm, sterile alboline solution be instilled into the bladder through a soft rubber catheter; this was soon followed by the passage of the stone per urethra. Manual movements along the course of the ureter have been suggested (Klemperer). Recently Jahr has devised an intraureteral method of dilating the ureter and thereby releasing the stone.

The operative treatment will always remain the choice of treatment in a definite number of cases. 1. Where one or more large stones are present, of such a size as to make their passage highly improbable or

impossible. 2. Failure of medical treatment (antiphlogistics, anodynes, urinary antiseptics, etc.) 3. Failure of the use of local treatment, such as lubricants and local anesthetics. 4. Cases of anuria in which the anuria has been present for forty-eight hours or more. In carrying out a uretero-lithotomy one should always bear in mind the possibility of the presence of stones higher or lower in the urinary tract, so as not to overlook them, and thereby to avoid the necessity of a second operation. This oversight can be checked by the use of the *x*-ray. Where this is not possible the question arises of combining uretero-lithotomy with a nephrotomy in order to examine the parenchyma of the kidney for the presence of stones. Some writers, as for example P. Wagner, are very positive in their views on this subject, for he says that uretero-lithotomy "should always" be carried out in combination with nephrotomy. This is a rather broad statement to make, especially if we consider that the *x*-ray shows the presence of calculi in approximately over 92 per cent. of the cases, these figures being based on the average as obtained from the figures of Kuemmell and Rumpel, 100 per cent.; Smith and Bevan, 92 per cent.; Leonard, 97 per cent.; Brewer, 78 per cent.

BIBLIOGRAPHY.

Albers-Schoenberg: Fortschritte auf dem gebiete der Roentgen Strahlen, vol. ix, No. 4, p. 255.
Bevan and Smith: Surgery, Gynecology and Obstetrics, June, 1908.
Cospedal: Jahresbericht für Chirurgie, 1906, p. 1107.
Deaver: Annales of Surgery, vol. xliii, p. 733.
Eschenbach: Zentralblatt f. Chir., 1906, p. 782.
Federoff: Zeitschrift für Urologie, Bd. 3, H. 1, p. 65.
Bevan and Smith: Surgery, Gynecology and Surgery, June, 1908.
Fenwick: Lancet, September, 1907.
Fenwick: British Med. Journal, June 17, 1905.
Fiori: Zentralblatt für chir., 1905, p. 564.
Fowler: Annals of Surgery, December, 1904.
Gibbon: Annals of Surgery, 1906, p. 743.
Goebell, R.: Deutsche Zeitsch. f. Chirurgie, Bd. 83.
Harris, M. L.: Medicine, August, 1905.
Israel, J.: Muench. Med. Wochenschrift, 1907, p. 1559.
Jahr: Muench. Med. Wochenschrift, 1907, p. 1181.
Kollscher-Schmidt: Journal Am. Med. Assn., Nov. 9, 1901.
Krogius, A.: Jahresbericht für Chirurgie, 1906, p. 1108.
Kümmell and Graff: Handbuch d. f. Chirurgie; von Bergman and Bruns, vol. v, p. 238, 1907.
Mohr: Ref. Zentralblatt für Chirurgie, 1908, p. 508.
Parker: British Med. Journal, July 21, 1906.
Reichman: Fortschritte: A. D. Gebiete der Roentgen Strahlen, Bd. 9, H. 4.
Schenk: Zentralblatt f. Gynekologie, 1906, No. 36, p. 1991.
Voelcker and Lichtenberg: Muench. Med. Wochenschrift, 1906, p. 105.
Williams, R. J.: Lancet, May 4, 1907, p. 1233.

VESICAL SYMPTOMS DUE TO DISEASES EXTERNAL TO THE BLADDER.*

LOUIS E. SCHMIDT, M.D.
CHICAGO.

Every practitioner recognizes the fact that there are many general, or constitutional, and local diseases which are productive of vesical symptoms. In this paper I shall not discuss the so-called primary diseases of the bladder. I shall refer to local conditions either adjacent to or at some distance from the bladder, which may be productive of vesical

* Read at the Fifty-Ninth Annual Meeting of the Illinois State Medical Society, Quincy, May 19, 1909.

symptoms. They are oftentimes, yet not necessarily, the distinct cause of secondary changes in the bladder. As to the constitutional diseases producing bladder symptoms, I am inclined to believe that all are the cause, sooner or later, of distinct changes in the bladder wall, mucous membrane or vascular supply. I believe it is universally admitted at the present time that the correct interpretation of the images which the cystoscope permits has been the cause of distinct progress in this field of work. In bringing this subject up for your consideration, I feel as if I ought to give you the reason therefor. It is this: It has been my good fortune to have been allotted a fair experience. I noted that error in diagnosis constantly occurred. It became necessary, therefore, to look about and to eliminate every possible source of error. I have now, for many years, previous to cystoscopic examination, always insisted upon the following: Careful history; physical examination; urinary examination; special tests, blood, bacteriologic, tuberculin test and *x*-ray examination. These, naturally, only in selected cases. Permit me to point out a few facts in connection with the suggestions just made which will show the necessity, not imperatively in all cases, but in those obscure ones which usually require time and thought in coming to any conclusions.

1. As to the anamnesis, I believe important data may be gained, when the order in which symptoms occur or when vesical symptoms are considered in connection with other symptoms, etc., and which gives invaluable information when the cystoscopic findings are considered.

2. Physical examinations are not to be confined simply to the urinary organs or to the neighboring organs, but every organ should be considered, as well as in relation to general diseases. I need only cite as examples, renal disturbances, appendiceal conditions, pulmonary affections and general nervous affections, all of which may produce vesical symptoms.

3. As to urinary examinations, it scarcely needs any explanation. So frequently there are intermittent variations in the urinary findings, which naturally point directly to certain conditions. Bacteriologic, chemical and microscopic methods should be employed.

4. The special modes of examination give, oftentimes, the desired information. I need only point out the *x*-ray pictures, showing lead bougie in the ureter as first devised and shown in 1901 by Dr. Kolischer and myself. The tuberculin test is necessary, as the *Bacillus tuberculosis* is not always found readily in the urine, nor can the cystoscope picture always be recognized, so this test may be an aid in establishing a diagnosis. Again, a blood examination may aid one in coming to correct conclusions.

After going through this preliminary work, the cystoscopic examination is in order. When this is carried out according to prescribed regulations, if the images seen are correctly interpreted, it is possible to come to more accurate diagnosis and to fail less often than if these precautions are not taken. I can conscientiously urge all who undertake this field of work to consider carefully the importance of all this. I might

add that it is not unusual to reverse the order of things, and I am convinced that it often then becomes necessary to insist upon a second examination. All patients are averse to such procedures, and naturally, if they could have been avoided, are perfectly correct in objecting.

I need not in this article burden you with the technic of cystoscopy. This topic has been carefully outlined many times, and all who are interested in this subject are perfectly familiar with all the essential details. It scarcely behooves me to state that the accuracy and adeptness with which one carries out the different modes of procedure are oftentimes of vital importance for the correct solution of the problems which present themselves for our deliberations. Neither shall I advocate or condemn certain instruments or modes of examination or differences in methods of procedure, but I wish it understood that I firmly believe in the teachings of Nitze and the use of cystoscopes made on the principles which he perfected.

I readily confess that I still have failures, but I am positive that whenever I adhere strictly to all I have stated, I have eliminated all the possible points or roads which permit the introduction of error. That there is one great field for error which can never be eliminated, no matter how great our individual experience, must be admitted. It is the personal equation of being able to interpret correctly the images which are seen through the cystoscope. It must be admitted that the cystoscope is an instrument of precision. Therefore, by having all room for error eliminated and using an instrument of precision, a diagnosis can only be established by judging correctly the findings. For this reason, if failures are recorded, they are due entirely to the cystoscopist and the methods and instruments are not to be condemned.

Before proceeding, it will not be out of place to mention—a part never to be overlooked—that two or more diseases may be present in producing vesical symptoms; hence, clear judgment and a knowledge of general, as well as of genitourinary, symptomatology are essential in drawing deductions. To illustrate this point, I need only mention the question which frequently arises: "Are the cystoscopic findings of the bladder commensurate with the symptoms?" Or, "Are the symptoms which are present due to the findings, and is it necessary to consider other factors?" In discussing this subject, I shall not use the classification which is so familiar to all:

1. Symptoms due to conditions above the bladder.
2. Symptoms due to bladder diseases.
3. Symptoms due to conditions in front of the bladder.

This classification obviously does not include many conditions that give rise to vesical symptoms. However, it is useful and of help in many instances. I wish to present a classification which I have evolved from various sources and which I have found useful, and I might state even necessary, in many instances. If it is adhered to in regular routine, I am certain that it must be of help whenever consideration of unusual conditions arises.

1. Bladder symptoms due to constitutional or general diseases which are common to both sexes.

2. Bladder symptoms due to diseases of neighboring organs or other urinary organs, which are common to both sexes.

3. Bladder symptoms due to physiologic or pathologic conditions of the female genitalia, and hence present only in the female.

4. Bladder symptoms due to pathologic conditions of the male genitalia, and hence present only in the male.

5. Bladder symptoms due to primary pathologic conditions of the bladder itself, common to both sexes. In this article, as I have already stated, I shall not take this last division into consideration.

If the history, the physical condition, the urinary examination and other laboratory tests all point to a constitutional condition, what may be expected from the cystoscopic examination? If no other condition is present to complicate matters, naturally, findings are to be expected to correspond with our knowledge on these topics. Now, in what manner do the diseases in this subdivision (1) influence the bladder? Polyuria, oliguria and chemical examination of urine, certain diatheses, toxins, etc., may all cause local irritation of the bladder. Some of these general conditions, on account of circulatory disturbances, may affect the centers of the brain and cord. In this great subdivision cystoscopic findings are often negative; in some instances slight vascular changes are noticeable, and in others slight, frail and generalized trabeculization is to be found, particularly if the sickness is one of some duration. I might add the cystoscopic examinations are not always to be recommended in this class; however, they may become necessary in order to exclude other conditions which may also give rise to vesical symptoms.

As an example, I shall refer to locomotor ataxia. Take the incipient cases, where cardinal symptoms are absent, but where from other signs and symptoms, spinal lesions would have to be considered; cystoscopically minute, frail and generalized trabeculization is, according to our knowledge, expected and usually found. This peculiar condition in conjunction with other factors is of aid in this particular class of cases to permit of making an early diagnosis of incipient tabes. It is, I might state, regarded as of considerable importance, and I have found it of value in many instances. It is frequently present before any marked urinary symptoms occur.

Now, allow me to take up the second division in my classification: the neighboring organs and the other urinary organs. These undoubtedly influence the bladder in a greater degree than all the other organs and general conditions already mentioned. Kidneys, ureters, appendix and all other organs which are common to both sexes should be examined for with careful attention and detail. It is in these cases, in order to interpret the negative cystoscopic findings correctly, that the beforementioned examinations should be made with much care. If any of the smallest secondary bladder findings are present, it assists or aids in showing the positive physical examination findings to be the cause of the vesical symptoms. Now, let us take up vesical symptoms produced by

appendiceal diseases. Seelig of St. Louis reports three cases belonging to this class, characterized by pain radiating from the kidney region, blood in the urine, and one of the three with frequent, painful urination. As this last case is one of much interest from more than one standpoint, it certainly is worth reporting in detail:

The cystoscopic report of Dr. Johnson shows bladder mucosa normal; both ureteral orifices normal. Left ureteral catheterization permits catheter to pass readily into pelvis; right ureter permits catheter to be passed only two inches from ureteral orifice. Even a catheter with mandrin could not be passed beyond the obstruction. *X*-ray plates made at three different times showed in each instance a clear-cut shadow in the course of the intrapelvic portion of the right ureter. Pain was persistent, excruciating and incessant after the catheterization, and this symptom confirmed the belief that a stone had been dislodged. The ureter was exposed from kidney to bladder, but no stone was found in it. At the site where the *x*-ray showed a shadow the ureter was kinked as if pulled upward and inward. At the site of kinking there seemed to be a hard nodule resting on the anterior surface of the ureter, and in order to determine what this nodule was the peritoneum was opened. It was found that an adherent appendix, with a concretion, was causing the kinking of the ureter. An appendectomy was done and *x*-ray of this showed a distinct shadow corresponding to the one seen in the other plates.

Seelig concludes that hematuria in cases of appendicitis in his record of three successive cases may be caused by the action of toxins on the kidneys; by direct involvement of the kidney; or by direct involvement of the ureter. In these, as well as in all similar cases, the cystoscopic findings may be negative, except for the urine being emitted from the ureters. Cases of pyelitis in the course of appendiceal conditions are not at all uncommon, and the vesical symtoms are oftentimes pronounced. Again, inflammatory conditions may extend toward the bladder and involve it by extension. In one case of chronic appendicitis I noted edema bullosum involving the *bas fond* of the bladder. Not to forget, I wish to mention in passing, that vesical symptoms can be and often are produced by rectal and anal cases; hemorrhoids, polyps, anal fissures and fistulæ, and teniæ and intra-abdominal and extra-abdominal conditions of all kinds, inclusive of the appendix, are to be considered. It would be an easy matter to cite instances where the above causes were the etiologic factors of vesical symptoms.

At this point I wish to remind you that so many cases that come for examination have had gonorrhea. How is it always possible to state with certainty that any of the bladder symptoms are not caused by some of the conditions caused by the gonorrhea or by some of its processes which may still be active? Naturally, only by careful examinations, concerning which I need not go into detail here.

Let us take up the kidney and ureteral diseases and injuries, for instance, which produce vesical symptoms. What are the cystoscopic findings? I will hurriedly review some of them, but I wish to state that, in a general way, most renal diseases are accompanied by bladder symptoms. They are either produced reflexly or directly, and here one may or may not find secondary bladder changes. There may be direct extension of disease from the kidney to the bladder. In these cases positive cys-

toscopic evidence is found. Finally, changes in the character of the urine. Here, cystoscopically, it is often impossible to notice the character of the urine emitted from the ureteral orifices, and which permits of diagnosing certain conditions; however, ureteral catheterization is indicated.

A man aged 31 years acquired gonorrhea. At the end of three to four weeks there was frequency of urination, with tenesmus and pain. This continued with more or less severity for the past two years. Apparently, at the beginning, it was nothing more than an acute posterior urethritis. He placed himself under the care of various physicians, who gave him the usual treatment for prostatitis, etc. His urine was slightly turbid, due to pus, and a few red blood corpuscles. There was apparently no other sign or symptom at the time of examination.

He was given a cystoscopic following a most careful physical examination, and it was at once noted that his symptoms were altogether out of proportion to the findings per rectum, per urethra and bladder. Double catheterization was undertaken and the urine from the left side corresponded to the findings of mixed specimen. The *x*-ray revealed stone. Nephrectomy was done. The greater portion of the kidney substance had been destroyed by active abscesses and numerous stones were found. At the end of four weeks he finds himself free from all signs and symptoms.

This is an example of how and why it is necessary to exclude gonorrhea and its sequelæ as the cause of vesical symptoms, and a pronounced case where absolutely and positively only vesical symptoms were present in a distinct renal condition, and in the absence of all other causes.

One and one-half year ago a medical student consulted me for hematuria and frequency of urination. He had never had any venereal disease. The condition had existed but a few days. Cystoscopically the bladder was entirely negative; blood was noticed to be unilateral. Double catheterization and functional tests were carried out, as well as a bacteriologic examination. The diagnosis was tuberculosis. He refused operation and took up the opsonic treatment. Nine months had elapsed until I saw him again, and some three months previous a nephrectomy had been done, but his urinary symptoms had become much worse and still persisted after the operation. Cystoscopically a marked tuberculosis of the greater portion of the bladder was now present. Vesical symptoms were present at both examinations; at the former no bladder changes, in the latter bladder changes present were due to descending infection, and when the kidney was no longer the cause of the vesical symptoms, as it had been removed.

Some six years ago I removed an infected-stone kidney in a young man aged 26 years. His symptoms disappeared. However, in the past three years he has complained of an increased frequency of urination, passing large quantities of urine. He has been submitted regularly for three years to all the afore mentioned modes of examination, including *x*-ray and cystoscopy, and always with negative findings. Only within the past month, however, has the cause been found. The *x*-ray shows positively the presence of a small stone. All this time it was an impossibility for me to tell him the cause, yet I have been constantly on the lookout for this condition. Not less than seven or eight *x*-ray examinations, all by competent workers, had been made in the past two and one-half to three years.

I wish to show this case as an example wherein all the findings were negative until the radiogram established the positive diagnosis.

Now, for the subdivision of diseases which are only to be found in the female. Naturally, where these organs are practically all in the pelvis, our examination is confined to these parts. Every up-to-date gynecologist recognizes the importance of cystoscopy. Consider the relationship and the intimacy of the urinary organs with the female genitalia.

Could anything else be expected when two systems are so closely associated? The enormous number, if I may be permitted to say so, of functional disturbance and diseases of the bladder in gynecology necessitates a modern gynecologist to be a urologist and cystoscopist. As for myself, I believe a urologist and one who makes pretensions to being a cystoscopist, can scarcely confine his efforts to the male. Yet this is done only too often. A cystoscopist who undertakes to examine women with the cystoscope must, therefore, for the foregoing reasons, be competent to make thorough pelvic examinations. It is in this particular subdivision that one sees so-called secondary changes in the bladder so often, from which inferences must be drawn correctly in order to make positive assertions. There are times when cystoscopy reveals conditions of the female internal genitalia, where physical examination fails, or where conditions have been overlooked in such an examination. As to the group of diseases common only in the female, here certainly one finds organs whose relationship to the urinary organs is fairly intimate, but these organs both in health and disease may have influence on the bladder and produce vesical symptoms. These sexual organs are open to a large number of variations from the normal; I need mention only displacements, etc., and these, as well as inflammatory or other pathologic conditions are productive of influences on the bladder causative of symptoms. Permit me to mention some of the physiologic processes of the genitalia in women which oftentimes gives rise to vesical symptoms: Menstruation has been shown frequently to be accompanied by a congestion of the bladder—cystoscopically, this has been recognized. Whether or not vesical symptoms are positively due to the congestion of the bladder is not certain. Now, let us consider pregnancy, labor and the puerperium. During these periods there are undoubted changes in the bladder that are associated with the growth of the uterus and with the greater vascular supply of all the plevic organs. Cystoscopically increased, full and more worm-like vessels. The veins are also more pronounced. Naturally, the color of the mucous membrane becomes slightly darker in hue. The trigone is particularly involved, and besides the interureteric ligament becomes more pronounced. As the uterus enlarges there is a characteristic depression of the posterior wall of the bladder. This commences in the fourth week. The longer the uterus remains in the pelvis, the more pronounced the depression. In the third to the fourth month, the depression disturbs cystoscopy. In these cases great care must be taken in cystoscopic examinations, as the bladder has a peculiar shape. The ureteral orifices are naturally displaced under these conditions.

In the puerperium, according to Stoeckel, there is a similar finding as regards hyperemia and turgescence. But besides typical findings, there may be edema of the internal urethral orifice, with irregular folds of the bladder wall, and oftentimes signs of traumatism due to the passage of the child or to instrumentation. This condition is not to be mistaken for edema bullosum.

Following the menopause, there are distinct senile changes in the bladder. There is an anemic appearance and an atrophic condition of the

mucous membrane, yet with irregular folds, due to loss of elasticity. These changes occurring immediately following conception, are probably due to a physiologic-chemical irritation. Naturally, in the growth of the embryo, mechanical insults and passive congestion may result; even varicosities have occurred under these circumstances. In the late periods of pregnancy, severe ureteral compression, one or both, with ureteral orifice changes, have been recorded. Naturally, all kinds of changes take place in the kidneys. Pregnancy, labor and the puerperium give rise and are predisposing causes to infection, and consequently the positive cystoscopic findings are not at all uncommon. All these changes enumerated give rise to manifold vesical symptoms. Pyelitis during pregnancy has been given much attention, particularly from a cystoscopic standpoint, in diagnosis and treatment. I wish to add that in most of these cases there is an absence of any cystitis. Pathologic labor may give rise to numerous interesting conditions.

There are many gynecologic conditions that give rise to bladder changes, and it is these changes that cause the symptoms. I need only mention prolapse, cystocele and descent of the anterior wall of the vagina. Here we deal with the anterior vaginal wall closely connected with the bladder. Whatever occurs to the vaginal wall will necessarily also occur with a portion of the bladder. The cystocele which results is oftentimes very marked. Cystoscopic findings also naturally are different. Distortion of the trigone, ureteral orifices, appearance of mucous membranes and other changes are readily seen cystoscopically. Often the cystocele must be supported by a tampon if cystoscopy is to be undertaken. On account of the folds resulting from this, the finger must be used to straighten them while examining with the cystoscope. In all instances of retroflexion and retroversion, the bladder takes part. Also in any dislocation, etc. It is scarcely possible to describe all the peculiar bladder configurations that may occur from these changes. Oftentimes at the time of introducing the cystoscope the shape and position of the bladder is made noticeable. Stoeckel records numerous cases, where from cystoscopic examination, considering the configuration of the bladder, location and appearance of the trigone, he made diagnosis of some of these gynecologic conditions. Any gynecologic condition in the pelvis that has a tendency to form a tumor may produce strange configurations of the bladder. Yet certain factors, as regards the tumor producing these configurations can be suggested, and aid or substantiate a diagnosis. As to the character of the tumor, nothing absolutely positive can be elicited. For instance, myomata, small ones, if on the anterior wall of the uterus, might produce depressions and elevations on the posterior wall of the bladder. If the uterus is much enlarged it might produce an appearance in the bladder like that caused by a pregnant uterus; however, there would be much less hyperemia. It is estimated that two-thirds of the women suffering from myomata have bladder symptoms. Ovarian, tubal and extrauterine pregnancy: The ovarian and tubal tumors do not show anything positive cystoscopically; some may become adherent and cases of rupture have been recorded. At the present time I have under ob-

servation a case of pyo-salpingitis which ruptured into the bladder and produced vesical symptoms. Extrauterine pregnancy shows nothing positive unless rupture into the bladder occurs. Parametritis exudates: Oftentimes this tumor produces elevation, etc., and at the most pronounced point it nearly always produces edema bullosum. This is a peculiar kind of edema first described by Kolischer in these conditions. Naturally, where parametritis is frequent, this condition is common. The bladder wall is edematous and there are clear, grape-like swellings present, sometimes reaching the size of a small pea, usually pale in color, or sometimes slightly purplish. They are smooth and glistening and apparently float. This condition is usually circumscribed. It may arise whenever a process external to the bladder becomes adherent to the bladder. Formerly it was supposed to occur only in inflammatory diseases. However, it has been noticed when cancer of the uterus has become adherent to the bladder wall. It occurs near ulcerations, follows fistula operations, and is a manifestation of bacterial or neoplastic irritation.

Cancer of the uterus and vagina: These do not, as a rule, invade the bladder. They grow around it and compress it more or less, but become attached only when fairly advanced. Cancer of the cervix is the most usual type to involve the bladder. There are no particular changes in the bladder until the cancer is well advanced. Its characteristic findings are nodulated surface pressing on trigone, involvement of trigone, and depressions between the elevations. These may become more pronounced and even the presence of edema bullosum be noted; and finally, distinct cancerous changes in the bladder wall itself may occur. Therefore, cystoscopically, oftentimes some information as to the stage of advancement of the cancer may be obtained, which is of help to the surgeon in selecting operative cases. Traumatism, externally, may show signs cystoscopically, following vaginal or rectal examinations. By permanent and fixed conditions of the uterus marked symptoms may be caused. Operations, such as Adams-Alexander and ventrofixation, produce all kinds of distortions with other conditions, such as circulatory disturbances, and these can be recognized cystoscopically. Many other operative interferences give rise to vesical symptoms. Some ureteral conditions may be diagnosticated by the appearance of the ureteral orifices, of fistula, etc.

Now, for the last sub-class; diseases only present in the male. The external genitalia, as well as the internal genitalia, are the only organs that must be taken into consideration. Inspection, palpation, percussion, rectal and bimanual examinations are the modes of examination on which one relies. It is almost needless to state that instrumental examination, diagnostic sounds, to show the presence or absence of strictures, and other instrumental examinations at times may be indicated. This also holds true in the previous class of cases. Here, too, abdominal examination for the presence or absence of retention is made. At times, it may be desirable to examine with a catheter or with other instruments. Considering the class of diseases producing vesical symptoms which are present only

in the male, they naturally can be produced only by organs found in this sex. Strange as it my seem, the greater amount of pioneer work in cystoscopy was done in the male. Urologists were undoubtedly the first as a class to take up this mode of examination. Their experience tends more to the treating of males; therefore, I believe there is a more accurate knowledge of this class of cases than of the corresponding class in the female. The sexual organs are those to which I have particular reference. It is true that there is a greater intimacy of the sexual organs with the urinary organs in the male than in the female, yet they do not occupy the same extent. Let us take the subject of the prostate into consideration. This one, if no other, has been repeatedly and thoroughly discussed. I need only mention that no matter what the character of the enlargement is, the bladder findings may be the same, except for the character of the prostate within the viscus. It is needless for me to state that one meets with lateral lobe enlargement, median lobe enlargement, or a combination, also collar-shaped and horseshoe-shaped enlargements. One should not forget that there are intraurethral hypertrophic nodules which may be productive of the same symptoms and be productive of the same bladder findings. What are they? As these conditions are obstructive to the outflow of urine, naturally the findings are secondary, practically only trabeculization of a more or less marked character. At the beginning, these changes are mostly in the *bas fond* and adjacent parts, yet sooner or later they involve the entire bladder. The muscular bands are coarser in the base, interspersed with finer bundles. Acutely or chronically inflamed prostates also give rise to bladder symptoms. It rarely ever becomes a necessity to make an examination in the former. The latter, and I might add true cancer of the prostate, are productive of obstructive conditions, and cystoscopically, there may be the same findings as in senile enlargement. It is common knowledge that diseases of the seminal vesicles can give rise, both in the old and the young, to all the symptoms of cystitis. Now, what do we find cystoscopically? I might say that it depends on the condition of the vesicles. If they are more or less acutely inflamed, whether distended or not, etc., there may be bulging of the portions of the bladder adjacent to them; even some of the inflammatory conditions, by extension, may be present, etc. Naturally, in elderly persons, prostatic enlargement may in addition also be present; also contraction of the neck, but this occurs more frequently in the middle-aged. These may, and usually do, produce accessory findings. Let us take the latter condition into consideration. Cystoscopically, one sees the internal orifice more or less even, apparently glistening and pale-pink in color, surrounding the cystoscope window when turning the instrument around on its axis, without withdrawing or introducing it alternately. In addition to these, of course, the common changes produced by obstruction are present.

Not to overlook the simple cases, I wish to mention cases of stricture, not narrow, or even where it is possible to pass only a filiform bougie, but the large number of cases suffering from wide strictures which produce all kinds of vesical symptoms. These wide strictures are always

overlooked unless diagnostic instruments are used, and I have frequently seen physicians who have been at a loss to diagnose the bladder symptoms, because they were overlooked. The cystoscopic findings in these cases always, at least in fairly advanced cases, are of more or less long standing, and always show trabeculization. Whenever this condition is noted, it is our first aim to exclude all obstructive conditions. Therefore, if a cystoscopic examination is made previous to the passing of diagnostic instruments, I immediately follow it. Why do I not precede with it? Simply because such a procedure may cause an irritability of the bladder or even cause a hemorrhage if the stricture is succulent, and prevent in this way a satisfactory examination with the cystoscope. I do not wish to discuss the use of cystoscopes. I have reference to the Nitze type. It can be stated that there have been many types of instrument devised to overcome this obstacle, as well as others which I need not mention, as this topic is not now under consideration. Strictures of the female urethra are not at all uncommon, and are, as in the male, productive of similar symptoms. It is needless to cite examples, although I have many records both of male and female cases. Take, for instance, diseases of the caput gallinaginis, the utriculus, the urethra, with its polyps, varicosities, fissures, etc., into consideration, and again one finds many causes for conditions such as those under discussion. I have for years kept these in mind, and need only add that thorough examinations are a necessity in order to exclude these as the causes of vesical symptoms.

In recalling my classification, I wish it positively understood that I have not even attempted to enumerate all the diseases and conditions in each subdivision which, directly or indirectly, produce the symptoms just discussed. I have made an outline which I hope will be of service to those who have this subject at heart. I might even add that some important lesions have been omitted, and again, minor ones have been taken up with more or less detail.

DISCUSSION ON THE JOINT PAPER OF DRS. BEVAN AND KRETSCHMER; ALSO ON THE PAPERS OF DRS. KOLISCHER AND SCHMIDT.

Dr. Arthur Dean Bevan, Chicago:—Mr. President: It is very late and there are several interesting papers still on the program, consequently I shall have very little to say. Dr. Kretschmer did not have the opportunity to describe, nor did he include in his paper the exact technic employed in removing this ureteral stone. A word in regard to that. We employed the old-fashioned incision, which was used originally for ligating the common iliac artery, practically a McBurney incision, but not entering the peritoneum at all. A large gridiron incision was employed, the peritoneum and transversalis fascia pushed to one side, and the ureter found behind the peritoneum. We left an ureteral catheter in the ureter, and it proved to be of great assistance because it enabled us to feel the ureter and the stone, and with a couple of blunt hooks the ureteral catheter and stone were pulled easily into view, and a knife used to divide the ureter over the stone, a small incision being made, the stone removed, and one or two fine catgut stitches used in closing the ureter. The man left the hospital within twelve days, so that recovery was interrupted. This is the best method for removing ureteral stones in that position. Where the stones are much lower down in close contact with the bladder, immediately behind the bladder, the parasacral route may be necessary, unless some intravesical means of removing the stone or stones can be used.

In regard to our experience with kidney stone in general, I may say that in 1897 I was the first man in the United States to make a successful diagnosis with

the *x*-ray of stone in the kidney, which was definitely shown by operation. Since 1897 we have had about sixty stone cases in my service, and the *x*-rays which you have seen are largely from my service at the Presbyterian Hospital, the work being done by Dr. Potter. This class of work shows distinctly the necessity of team work. You have to have an expert *x*-ray man, an expert in the use of the cystoscope, in passing the ureteral catheter, like Dr. Kretschmer, and a surgeon, who is the other factor in the case. You have to have a laboratory man who can make a complete and careful examination of the urine. The operating surgeon must be able to control and superintend the entire work. Of the sixty cases we have had, in not a single instance, where we have made pyelotomy or nephrolithotomy, have we lost a patient. We have lost two cases of nephrectomy in connection with kidney stone work, because of their difficulty, and because they were secondary nephrectomies, with perinephritic adhesions. We have made but one mistake in diagnosis by the use of the *x*-ray in this entire series, and that was a case in which we did not recognize stone, but made an operation and removed the stone. Going back to our plate, we could distinctly see it was a small stone behind the twelfth rib. I do not know of any line of work that is so fascinating and so capable of giving satisfactory results, if you do good team work, as in kidney and ureteral stones.

Dr. John B. Deaver, of Philadelphia:—I was delighted with Dr. Bevan's remarks regarding these cases of stone in the kidney and ureter. It falls to my lot to operate on a number of such cases. I can see the great advantage and benefit which can accrue from team work in connection with these cases, and Dr. Bevan is very fortunate in having connected with his service such men as he has mentioned. Relative to the paper of Dr. Kolischer, I am a believer in the suprapubic method of removing the enlarged prostate in the majority of cases. I was glad to hear him "deal out," as they say in fistic parlance, solar plexus blows against the perineal operation. There were one or two points in connection with Dr. Kolischer's remarks which impressed me very much, and particularly with reference to inspection. In doing suprapubic prostatectomies, I see every step of the operations, the same as by the perineal route. I was particularly struck with Dr. Kolischer's remarks relative to the question of perineal drainage. I have yet to resort to perineal drainage, as I have been able to obtain satisfactory results from drainage above the pubes. As to the question of leaving the prostatic urethra, I leave it when I can do so. With regard to fistula and incontinence of urine, having done both of these operations, and having seen cases operated on by surgeons, I am convinced that more accidents follow the perineal than the suprapubic route. More damage is done to the anatomy of the parts by the perineal than by the suprapubic route. A French surgeon who does a large amount of perineal work recently said the day was not far distant when perineal prostatectomy would be done away with altogether on the Continent. It has been done away with already in England, and I feel that is true to a great extent in this country, yet there are a number of operators in the United States who are doing good perineal work.

Dr. James W. Hamilton, of Mount Vernon:—I had not intended to take part in this discussion, but I became interested to such an extent that I want to say a few words with regard to the question of the prostate gland. The prostate gland is one of the most important organs and has to do more generally with the comfort of the male than any organ we have to contend with. We have been making a series of histological studies of this gland recently, and I have become more and more convinced the deeper we have gone into the work that too little attention is paid to the anatomical structure of the organ. Now, you will find men often in middle life coming into the office complaining of lumbago and of various rheumatic pains radiating down the hips and thighs, chronic grunters from these causes, subject to changes in the weather, and if you examine these men with the index finger you will find either an hypertrophied or inflamed prostate gland in 90 per cent. of them. These patients will get no relief until you have treated

their prostate. I do not believe that surgical treatment of the prostate gland has so far overshadowed the medical treatment as to lead us to the belief that it is altogether a surgical disease. First, we have to deal with this gland practically from a medical standpoint. These patients come to us for medical relief, and we must relieve them, if possible. With regard to the histological aspect of this subject, if you will study the neurons supplying the end bulbs of Krause and the periprostatic tissue, you will find they are larger in cases of hypertrophy of the prostate gland than in the normal gland. The prostate gland is lying there, where it is subjected to continual movement by the perineal muscles, tender, hyperesthetic. You have a movement of these neurons in these bulbs, and then if you go a little further and study the hypogastric plexus and the sympathetic connection between the hypogastric and the spinal plexus, you will understand how a man has lumbago from an inflamed or hypertrophied prostate gland. That feature has been overlooked in the immediate rush for surgery of this organ. It has fallen to my lot to remove the prostate gland, and I remove it in every case by the perineal route, and I predict that in ten years from to-day men will change their minds with reference to the removal of this organ. I was much impressed with the illustration of Dr. Deaver in going through the cellar door instead of through the roof of the house in breaking in. I do not believe in this butterfly incision, nor do I believe in the crescent incision, for I cannot understand why men should destroy anatomical structures that can be left alone. A man who cannot remove the prostate gland through a straight incision in the median line is not competent to undertake the operation. If you resort to transverse incisions in any form you are bound to cut the genital distribution of the pudic nerves. I do not care whether the man's age is fifty or eighty, when you interfere with the genital distribution of the pudic nerve supply to the sexual organs, you have done to that man what you would do to a woman when you have removed her ovaries.

Dr. Kretschmer (closing the discussion on his part):—It is a well-known fact that patients who have a stone in the ureter do, at times, pass this stone of their own accord, so that we should not be in too much of a hurry to remove these stones surgically. Among the non-operative methods for removing stones from the ureter may be mentioned dilatation of the ureter, the application of local anesthetics, such as cocain or alypin solutions, and also the use of lubricants, such as olive oil, and sterile alboline. These procedures have been followed by the passage of stones down the ureter. These lubrications may also be applied to stones after they have reached the bladder. Such a case came to Dr. Bevan's service, and after using a sterile alboline solution in the bladder the stone was passed through the urethra. This stone was in the bladder for six or eight weeks.

Dr. Kolischer (closing the discussion):—This discussion has been a source of great satisfaction to me. The remarks made by Dr. Hamilton do not convince me that perineal prostatectomy is preferable to suprapubic prostatectomy. He did not disprove what I said in my arraignment against perineal prostatectomy. I think he will change his method of operating to the suprapubic when he has operated on a great many more cases, and he will find he will not have the troublesome consequences which all the surgeons have who operate on patients by the perineal route. I believe he will be one of our party.

What Dr. Bevan said about team work in kidney cases is very satisfactory, and it is very refreshing to have a general surgeon recognize the value of cystoscopy. Many years ago the majority of surgeons did not think the use of the cystoscope was necessary, but many of them have since changed their views, and it is encouraging to me to have a man of Dr. Bevan's standing recognize the value of cystoscopy, for the appreciation of which I have worked for twenty years. If I succeeded in having Dr. Deaver endorse the principal features of my remarks, I feel more amply and better rewarded than I expected.

THE PATHOLOGY AND DIAGNOSIS OF DILATATION OF THE RENAL PELVIS.*

LEWIS WINE BREMERMAN, A.M., M.D.

Formerly Professor Genito-Urinary Surgery, New York School Clinical Medicine; Genito-Urinary Surgeon to the Oak Park Hospital; Member American Urological Association.

CHICAGO.

Dilatation of the renal pelvis is classified under the group of renal conditions known as hydronephrosis and pyonephrosis, and as such I will endeavor to bring to your attention some of the more salient features regarding the pathology and diagnosis. As the diagnosis depends to a considerable degree upon the etiologic factors, these will be presented for due consideration. In conditions of hydronephrosis we have a distention of the renal pelvis, calices, the renal substance, one or all of them, produced by pressure of a retained fluid, the retention produced by an obstacle which prevents the free flow of urine from the kidney. The kidney involvement follows in the order given above, first by a dilatation of the pelvis, then by distention of the calices and finally by distention of the renal substances. It is a well-conceded fact that the obstruction if complete must be intermittent in character and if partial must be of long duration, as permanent complete obstruction will never produce hydronephrosis; the result will be atrophy of the kidney with total loss of renal function. If the obstruction is near the renal pelvis it will produce a condition of hydronephrosis much more rapidly than if the obstruction be more distant, as the retardation of the flow of urine caused by vesical neoplasms, prostatic obstruction or stricture of the urethra.

The important etiologic factors upon which the diagnosis depends are: calculi retained in the outlet of the pelvis or in the course of the ureter, stricture of the ureter, twists or kinks of the ureter and pressure on the ureter from without. Vesical tumors, the position of which are close to the ureteric orifice, enlarged prostate and urethral strictures are less common causes. The diagnosis of hydronephrosis may be frequently overlooked because there may be no distinct group of symptoms, but if the etiologic factors already mentioned be duly considered one will be led to suspect the condition to exist.

Physical examination of the patient may help little, as there is no evidence of tumor on deep palpation until rather late in the disease. Morris found tumor evident in 25 out of 42 cases. Hydronephrotic enlargement of the kidney when tumor may be palpated is recognized by percussion which will give distinct dulness, the area of dulness being influenced by the upward and downward notion of the diaphragm. When the tumor attains a very large size the colon and intestines are displaced; where the tumor is of moderate size the percussion note over the anterior surface of the enlargement will be resonant or tympanitic. Frequently the lobulated character of the mass may be outlined by deep palpation,

* Read at the Atlantic City Meeting of the American Urological Association, June, 1909.

and fluctuation may be elicited when the hydronephrotic condition attains considerable size. Aspiration with a fine needle through a part where there is distinct dulness on percussion will aid materially in establishing a diagnosis. In the intermittent form of hydronephrosis the alternating appearance and disappearance of the enlargement, together with appearance and disappearance of the pain, may be mentioned as rather prominent symptoms. In this form accompanying the disappearance of tumor a sudden discharge of a large quantity of urine into the bladder will occur; thus a period of polyuria.

The conditions from which hydronephrosis must be differentiated are pyonephrosis, perinephritic abscess, hydatid cyst of the liver or of the kidney, ovarian tumors, cystic diseases of the kidney and distended gall bladder. In pyonephrosis there will be present distinct septic phenomena with pus in the urine, which are absent in hydronephrosis. Ovarian tumors, unless very large or pedunculated, occupy a position much lower in the abdomen than is the case in hydronephrosis. Careful bimanuel examination will distinguish between the two. Enlargements of the liver are recognized as being very much more anterior than hydronephrosis, but frequently, only by aspiration, can a diagnosis between hydronephrosis and hydatid cyst be reached. The particular features in diagnosis which I wish to bring to your attention are not those just mentioned, which are evident late in the condition, but I wish to show the condition may be recognized early and possibly prevented, by finding early those conditions which will eventually produce hydronephrosis, and eradicate them.

Twists and kinks in the ureter are rather common causes of hydronephrosis and many times are the result of movable kidney. This variety is intermittent in character, the pelvis becoming well dilated, filling up, overcoming the kink by lifting the kidney, and then empties itself rapidly. The condition here may be readily overcome by nephropexy. Stone in the pelvis, blocking the outlet of the ureter, produces the same result. Diagnosis may be made by *x*-ray or by passing the wax-tipped catheter, scratch-mark upon which will aid us materially in corroborating our *x*-ray findings. The ultimate consequences concomitant with progressive hydronephrosis may be aborted by early recognizing the condition. The same may be said of stone occluding the ureter. It may be here mentioned that the passage of the wax-tipped catheter in the male is accompanied with just as great ease as it is in the female.

In the male the only cystoscope with which I am familiar that may be used for wax-tipped catheter work is the old model of the Tilden Brown instrument. In this instrument the catheter may be run through the catheter tubes backward, thus allowing the wax tip to extend beyond the end of the telescope and catheter tubes. After the bladder is dilated with liquid the catheter tube and telescope is gently passed; this may be performed without affecting the wax on the tip of the catheter, and the catheter may then be readily passed into the ureteric orifice. After the catheter has been gently pushed forward to the pelvis, if it meets no obstruction, it may be withdrawn and examined for markings, which are typical if it has been scratched by the rough edges of a calculus. It

is a well-known fact that frequently a stone passing along the ureter may take months in making its descent along the ureter or may become permanently lodged. The diagnosis of this condition is not difficult, and recognized early will present progressive hydronephrosis and destruction of the kidney.

Vesical neoplasms are rather commonly the cause of hydronephrosis. This is entirely due to the fact that their location is near the ureteric orifices. One case which has recently come under my observation showed at cystoscopic examination a pedunculated papilloma immediately above the right ureteric orifice, which dropped down over the ureteric orifice and prevented the flow of urine from that side. The patient complained of considerable pain in the right lumbar region which was intermittent in character. The distention of the pelvis was relieved by allowing the bladder to become distended, thus stretching the bladder and lifting the tumor away from the ureteric orifice; this was followed by rather copious polyuria and then a recurrence of the pain. This patient was under the observation of several surgeons; in some cases the lesion was diagnosed as renal and an operation recommended. She had never had a cystoscopic examination until she came to me. A cystotomy was performed, the papilloma removed, and the patient has made an uninterrupted recovery. I have catheterized the right ureter recently, which allows a No. 6 catheter to pass freely. There is a slight dilatation of the pelvis, which will hold about 20 c.c. of fluid. The sample of urine collected at this time was normal, her symptoms have entirely disappeared and she claims that she is perefectly well.

Strictures of the ureter are rather common and are the result of an inflammatory process of trauma, or may follow operative procedures upon the ureter, such as plastic work or the removal of ureteral stones. Stricture is not difficult to recognize. The ureteral catheter may be used to diagnose the condition, the size and location. One case under my observation had a ureteral calculus removed from the ureter ten inches from the lower end. This was followed by suppuration with a long-standing lumbar fistula, which eventually closed. When I first saw him I had difficulty in passing a No. 3 catheter; I have dilated this up to No. 6 French. However, due to the long-standing occlusion produced by the stone, there is a marked dilatation of the pelvis, which will hold about 180 c.c. of fluid. Infection had already taken place and the sac was full of purulent fluid which showed a large number of colon bacilli. This patient had had exceedingly large doses of dead bacilli, as high as several billion, without the slightest benefit. I have recommended a nephrectomy, as the kidney function is impaired and the general condition of the patient is rapidly falling below par.

Hydronephrosis begins as a distention of the pelvis which extends to the calices and renal tissue. With distention of the pelvis the kidney tissue becomes swollen with multiple ecchymoses, followed later by edema, paleness and atrophy beginning in the pyramids; the papillæ become flattened. The pyramids, as well as cortical substances, later on become gradually transformed into connective tissue due to interstitial infiltration, and finally a large multilocular sac is formed. At first the

kidney substance is extended like a cap over the dilated pelvis, but later on there is no kidney substance evident. It is unknown with what rapidity the kidney tissue and the secretion of urine disappear, for it has been shown that when these hydronephrotic kidneys, markedly enlarged with only a very small portion of the kidney structure visible, are opened and drained sometimes there is secretion of a large quantity of urine. The hydronephrotic sac becomes adherent to the surrounding organs from chronic inflammatory changes, which make its extirpation difficult. The sac usually contains a transparent fluid resembling urine. If there is active kidney substance present the fluid contains a variable amount of urea or uric acid, but if all the kidney substance has disappeared the fluid contains no urea or uric acid.

It is evident that progressive hydronephrosis is only eradicated by surgical interference, and, as I have shown, early diagnosis is essential, thus preventing the condition or interrupting its progression. The best means of diagnosis in hydronephrosis is cystoscopy and ureteral catheterization. With the cystoscope we are able to tell whether or not there is any obstruction in the bladder which would retard the flow from the ureter; we are able to study the appearance of the ureteric orifice. The characteristic appearance of the orifice is a very valuable aid in reaching a definite diagnosis of the renal condition. I have been criticised for the statement, nevertheless I am still inclined to believe that the appearance of the orifice and the manner of the efflux of urine is important. I have, however, seen conditions where the kidneys have been greatly involved with absolutely normal appearing ureteric orifices, and I have seen markedly changed orifices show no kidney lesions whatsoever. Yet, if the ureteric orifice is involved, it leads one to suppose that there is an accompanying kidney lesion.

If one ureteric orifice is normal, the other distinctly abnormal, then with a reasonable degree of certainty we can suspect the abnormal kidney condition to be on the side of the abnormal ureteric orifice. A stone occluding the ureter, near the ureteric orifice, gives characteristic findings as well as tuberculosis of the kidney. Dilatation of the ureter and kidney pelvis may be suspected when the ureteric orifice is seen like a pin point opening, with considerable edema of the surrounding mucosa. The ureteral catheter is an instrument of great importance in diagnosis. With it we are able to locate obstructions, elicit the fact whether or not they are produced by stricture or by stone. By passing the catheter upward into the kidney we can tell to a certainty by the flow of urine from the catheter the fact relative to dilatation. If the flow is very rapid, running in a continual stream, spurting out well from the catheter, it may be concluded with a reasonable degree of certainty that there is some distention with the contained fluid under pressure. The rapidity and amount of flow may be compared with the urine from the other kidney. With the cystoscope still in place, with as large a catheter as the ureter will take pushed into the kidney pelvis, inject into the end of the catheter colored fluid, watching carefully for the return flow down the ureter alongside of the catheter. If there is none, then all the fluid

remains in the kidney pelvis, and by measuring this fluid one is readily able to ascertain with some certainty the exact size of the dilatation. When the pelvis becomes distended there is a distinct sensation of fulness or pain felt by the patient. It must be remembered that the pelvis must be drained well before carrying on this procedure. The normal capacity of the pelvis must be considered. I have found in the male that the normal pelvis varies between 10 and 12 c.c. and in the female between 8 and 11 c.c. However, unless the pelvis contains more than 15 c.c., I do not consider the dilatation of any great importance. It must not be forgotten that many cases of simple hydronephrosis become infected and very rapidly the entire structure is riddled with pus areas.

The etiologic factors in hydronephrosis are easy to recognize, and by eradicating them the process of hydronephrosis can be prevented, or checked if it has already started, thus saving a kidney which, if the condition was allowed to progress, would eventually have to be removed. I have endeavored to show that the knowledge of the cystoscope and the use of the ureteral catheter are of paramount importance in such diagnostic work.

72 Madison Street.

A UNIQUE FOREIGN BODY IN THE MALE BLADDER AND THE REMOVAL BY SUPRAPUBIC CYSTOTOMY.*

H. O. White, M.D.

Professor of Anatomy in the Medical and Dental Departments of the University of Illinois

AND

R. Robinson Duff, M.D.

Assistant in Anatomy

CHICAGO.

It is with great pleasure that we present this case to you for your very kind consideration and discussion. It is of interest from the standpoint of the surgeon, neurologist, and last but not least, the anatomist. We have taken the liberty of going into the literature, anatomy and pathology carefully, and also attempted to elicit a careful family and personal history of the case in hand.

Family History.—Parents living and in good health. Of three brothers, the youngest has been ill all his life, having had all the diseases of childhood, and has met with a number of accidents; had St. Vitas dance three years ago, but is apparently well at the present time. Sisters all living and well. In considering other branches of the family tree I was unable to elicit anything that would even suggest mental derangement. Personal history: The patient, aged 28 years, a switchman, has had all the ordinary diseases of childhood; is fairly well nourished; height, 5 feet 9 inches; weight, 170 pounds; married and has three children; color, severe secondary anemia; expression, anxious; mental state, typical neurasthenia, melancholic. Present trouble (in patient's own words): About eight months ago he began to introduce the soft rubber tip of a urethral syringe into the external meatus to allay a supposed inflammation, which gave him a

* Read before the Douglas Park Branch of Chicago Medical Society.

great deal of pain. After becoming more expert in introducing foreign bodies into his urethra he introduced a lead pencil lubricated with vaselin, this being followed later by a Christmas candle. His statements were misleading, inasmuch as he stated that the foreign bodies were introduced to allay an inflammation. (See confession of patient two weeks later.) The foreign body slipped from between his fingers beyond reach, and passed back into the membranous urethra. In attempting to extract the candle he forced it deeper back until the last attempt forced it up into the bladder. The accident occurred on Monday morning at 9 a. m. He returned to work Monday night, worked all night until early Tuesday morning, when in urinating he noticed a burning sensation. During Tuesday his desire to urinate increased until by Tuesday night he was unable to go to work and passed his urine every half hour, which caused him great pain in the region of the bladder. He consulted a physician Wednesday morning. Was referred to me for surgical attention Wednesday afternoon. He was unable to walk and had great tenderness over the bladder. Passed urine every fifteen minutes, followed by a few drops of blood. He was given one-half grain morphin for pain and was sent to hospital Wednesday at 8 p. m.

Patient is very anemic, nervous, gives fictitious name and address. Temperature, 101.8; pulse, 130. External meatus widely dilated, red, congested; pus exuding from meatus upon pressure. Patient denies any history of gonorrheal infection. A 38 French sound passes into the bladder from its own momentum. Cannot palpate foreign body with sound. Sound can be rotated in every direction and causes great pain. Glans penis swollen, congested and tender, prepuce elongated, edematous. Cystoscopic examination reveals very severe cystitis, the mucous membrane of the bladder being swollen, red and congested; posteriorly where the end of the candle was imbedded is a small ulcer. The blood vessels are dilated, engorged and congested. The mucous membrane is covered with thick tenacious mucus mixed with blood. Cystoscope shows foreign body lying obliquely in the bladder. Urine cloudy; specific gravity, 1030; quantity, 3 ounces; reaction faintly acid; contains albumin and mucus; microscopically, pus and epithelial cells, red and white blood corpuscles, bacteria and various urinary crystals.

Hot fomentations were applied to lower abdomen and perineum and the bladder was irrigated with hot saturated solution of boric acid every two hours through the night. Morphin ¼ grain P. R. N. Intern was instructed to irrigate bladder four times before patient came to operating room, allowing 15 ounces to remain in the bladder. He informed me that the largest catheter would not retain solution, but that it ran out around catheter. A medium sized rectal tube proved a complete success. This was clamped off, leaving 15 ounces of fluid in the bladder, the object being to elevate the fundus of the bladder so as to reduce the danger of entering the peritoneal cavity. A suprapubic cystotomy was done and patient made an uneventful recovery.

Confession of patient two weeks after operation: When about twelve years of age I noticed an itching around the head of my penis, to relieve which I began to scratch it. This finally became so bad that I was scratching it most of the time (evident cause elongated adherent prepuce) until I found that I got a great deal of pleasure from manipulating my penis. Before I knew it I was abusing myself, and, Doctor, I have kept it up ever since. I have tried to overcome this habit. I know I am different from other men; I am ashamed to look them square in the eye. I much prefer to be alone. I thought by getting married I could overcome it, but I was unable to do so. The habit is a fixed one. When I come home in the morning from my work my wife is busy around the house and rather than trouble her I abuse myself. To tell you the truth, Doctor, there is more pleasure for me to abuse myself than there is in the normal act. Why did I introduce the candle into my urethra? Of late I have noticed that my sexual powers were getting less active, and I found that by introducing a foreign body into the meatus that it not only increased the sexual excitement but also increased the sexual act, and, Doctor, it was during the act itself that the foreign body accidentally slipped beyond my reach.

When I suggested to Dr. Duff to report the case and to submit a contribution on the subject, it was primarily with a sense of diffidence and more or less of a consciousness of temerity that he consented to reopen a subject which I anticipated must have been illuminated by the contributions of the most distinguished men of our profession. A review of the literature, however, fails to impress one with the weight that should have been attached both here and abroad to the opinions and conclusions upon the subject, and consequently arises the thought that the theme is exhausted.

So poorly has the field been worked out that a farther investigation from an anatomic, physiologic, as well as a pathologic standpoint, seemed indispensable. Though we are convinced of the futility of any attempt to contribute with entire originality on the subject, as well as on the complications that may arise therefrom, yet, in hope of eliciting from those present a discussion which in some degree may help to enlighten our present knowledge, this paper is submitted to your consideration. It is our belief, with Spencer, that "only by varied iteration can alien conception be forced on reluctant minds," and it behooves the man who would contribute his mite to the progress of his profession to exhibit his ideas to the criticism of his peers, that they may be either advocated or condemned.

Realizing as we do that the conditions necessary to lodge a foreign body in the bladder, intentionally as it were, are primarily psychologic and secondly accidental; the pathologic phenomena in such cases may be properly assumed to have existed long before the accident took place and belong to the domain of psychology which is not our intention to discuss this evening. The very accident therefore is only one of the manifestations, a symptom if you please, of a condition that had existed long before the accident. The pathologic state, however, of this, as well as of similar cases, are local only, and very simple, indeed, because they are generally acute and of such nature as would manifest themselves from any irritation by any foreign body placed intentionally or otherwise in any muscular viscus lined by a mucous or serous membrane under ordinary circumstances. From the history of the case, the confession of the patient, the action of the muscles constituting the prevesicular region, as well as the course of the urethra itself, one should have no difficulty to comprehend that a force necessary to propel a foreign body of reasonable magnitude through the urethra until it is finally lodged in the bladder must act in the opposite direction, i. e., toward instead of away from the bladder, which is the normal function of the muscles of this region. That normally the functions of the muscles of the genitourinary tract are distalward is abundantly demonstrated by the fact that a foreign body such as a urinary calculus, if not too large, will eventually, in a good many cases, be expelled through the meatus urinarius externus. Furthermore, the very act of urination, or seminal discharge at the time of copulation, proves the action of these muscles. It is for this reason that we wish to exhibit by original dissections the various structures of that region whose normal actions must be overcome,

if one would lodge a foreign body in the bladder, introduced through the meatus urinarius externus. Of all the structures of the genitourinary region the erector penis and the accelerator urinæ are the principal muscles whose normal physiologic action must be overcome if the foreign body is to pass beyond their control. To be sure, erection results from the distention of the venous plexus with blood due to nervous irritation originating in the part itself, or derived from the brain and spinal cord, which is communicated to the penis by the pudic nerve, ramifying in the vascular tissue. Even when no nervous irritation takes place the influx of blood alone is sufficient to cause enlargement and turgescence of the penis, but then the erection is not complete, nor can it be maintained for any length of time unless some force acts upon the veins, causing a sufficient compression, thereby preventing the further influx of blood or stopping the efflux. Both these functions are performed by the alternate contraction and relaxation of the two muscles above named. It is, however, necessary to understand the exact origins and insertions of these structures before we can derive definite conclusions as to their action. Ordinarily a muscle is attached to two objects, and by its contraction lessens the distance between them, and perchance compresses another structure, which may be located in its close proximity or enveloped by it. Now that part of the muscle which is attached to the more fixed point of these objects is named the origin and is usually the proximal end, while the one fastened to the more movable object, which is the distal end, is called the insertion. The terms, however, are entirely physiologic and largely conventional, since there is still a great deal of difference of opinion as to which of the two is the more fixed, and hence entitled to the name origin. Furthermore, the action may take place just as frequently from one place as from the other, from the origin or from the insertion. In the former the action is known as direct and in the latter indirect or reversed action. We must, however, be admonished that both actions can be demonstrated only in those muscles whose origins and insertions are more or less fixed, i. e., both ends attached to bony or cartilaginous structures, the rectus femoris, for instance, while its direct action is to extend the leg and by the further continuance of its contraction to flex the thigh, the reversed action of the same muscle is to help hold the pelvis erect, and by its continued action from below assists to flex the pelvis. In the case, however, of the levator palpebræ superioris direct action only can take place, since the origin is from the lesser wing of the sphenoid bone, a very fixed point indeed, and insertion into the tarsal cartilage of the upper lid, which is movable. It is clear, therefore, that the action of this muscle can only take place from its origin, i. e., direct, it being the fixed point. From the above constant and normal actions of muscles at large we may, with a sufficient amount of certainty, apply the same deductions to the two principal muscles of the genitourinary tract, erector penis and the accelerator urinæ, the first also known as ischio-cavernosus. The name alone sufficiently signifies its attachments and action, because it originates from the inner surface of the tuberosity and ramus of the ischium, and is inserted into

the sides and under surface of the crus penis. The origin is, therefore, fixed, as it were, and the insertion movable. Hence the action of this muscle can only be direct. It is in consequence of its attachments and possible direct action that it is able to compress the crus penis, thereby retarding or preventing altogether the immediate return of the venous blood, that it serves to maintain the organ erect. Hence its synonym, erector penis. The second also is called ejaculator urinæ, ejaculator seminis and bulbocavernosus. This muscle originates from the central tendinous point of the perineum as well as from the medium raphe and its fibers are inserted on the dorsal surface of the penis. In order to reach that place of insertion it is evident that it must travel outward and upward, encircling or covering the bulb and adjacent parts of the corpus spongiosum, and finally unite with its fellow of the opposite side by a central tendinous expansion. It is quite a broad layer of muscular tissue and envelops both the corpus spongiosum and corpora cavernosa, occasionally even to such an extent that the anterior fibers reach as far as the os pubis. The last-mentioned fibers of this muscle always terminate by a distinct tendinous expansion, which covers the dorsal vessels of the penis. Here we also see that the muscle is capable of contracting by direct action only, since its origin, the central tendinous point of the perineum, serves as a fixed point of support. On the other hand, when this muscle contracts it must compress the bulb and the corpus spongiosum, thereby narrowing the lumen of the urethra, which is situated in the spongiosum. While the anterior fibers will compress the vessels on the dorsum of the penis, retarding or preventing the efflux of venous blood and influx of arterial blood, thereby maintaining erection. It will be observed that the action of both muscles being direct, i. e., from their origin toward the insertion, it follows that they will tend to drive any substance out of the urethra, away from the bladder, through the meatus urinarius externus. It is evident that to introduce anything into the bladder sufficient force must be employed to overcome the normal action of these muscles. In other words, the action of the muscles must of necessity be reversed, acted against, indirect action.

817 Ashland Boulevard.

SURGICAL TREATMENT OF EXOPHTHALMIC GOITER.*

CARL E. BLACK, A.M., M.D.
JACKSONVILLE, ILL.

While I fully appreciate the honor of having been invited to take part in this important symposium, I feel that the surgical treatment of exophthalmic goiter deserves to be supported by some one who has had greater experience in the surgery of this organ than is possible for a general surgeon situated as I am. One cannot read the literature of the development of surgery of the thyroid during the past ten or fifteen

* Part of a Symposium on Exophthalmic Goiter, before the Illinois State Medical Society, May 20, 1909. The other papers and the discussion appeared in THE JOURNAL for September, page 243 to 261.

years without realizing that it is the story of the most wonderful scientific and technical achievement. The eminent colleagues who have preceded me have so thoroughly described the disease and its medical treatment that I will confine what I have to say entirely to the surgical considerations.

In dealing with this disease we must necessarily study methods of treatment from the standpoint of results. The first question which presents itself is the natural history of the disease. What have we to expect in cases which have no treatment? It is pretty well determined that when the disease remains untreated it is usually progressive, although some authors claim that fully 25 per cent. of all cases will recover without treatment or in spite of treatment. It is difficult to determine these facts. Many cases are overlooked and a diagnosis is never made, while many others die of some intercurrent affection before the natural course of the disease is fully determined. In fact, it has been too much the habit of physicians to overlook this disease entirely in its early stages, or even in its later stages, when all of the characteristic phenomena were not present. We must remember that one or two of the four principal manifestations of exophthalmic goiter may be absent and yet the diagnosis may be perfectly plain if the signs and symptoms are properly analyzed. Too many of these cases are treated for heart disease, intestinal toxemia or nervous disease. This is, no doubt, partly due to the use of the unfortunate term, exophthalmic goiter. It would be far better if there could be a general adoption of the term "thyrotoxicosis," used by Kocher. At least 75 per cent. of these cases are progressive and will terminate unfortunately unless some form of treatment is instituted by which the intoxication from the thyroid can be stopped or modified.

What can be said of the prognosis of cases treated medically? I fail to see how one can read the literature of the disease without being impressed with the great inefficiency of all forms of medical treatment, including electricity and *x*-rays. With the one exception of iodin, no drug seems to have any special affinity for the thyroid gland or influence on its action. Undoubtedly the greatest good accomplished by medical treatment is due to the dietetic, hygienic and prophylactic regime. Patients are put to rest; their diet is regulated; they are placed in better hygienic and climatic surroundings and given the general tonic influence of baths, and as a result they are temporarily better. If they happen to be among the 25 per cent. of cases which would recover spontaneously, they become entirely well, and the result is unjustly credited to the form of treatment. There are three chances out of four, however, that the disease will be progressive, and the benefit from these general measures will only be transient. Such measures are fully as applicable to the surgical as to the medical, or any other form of treatment. A just criticism of the treatment of these cases by many surgeons has been a failure to appreciate the value of these measures in properly preparing patients for operation and protecting them during and after operation. As a matter of fact, the majority of the members of the medical profession are to-day unadvised as to the results obtained by well devised and applied technic

on patients properly prepared. It is only the occasional physician who is informed as to the variety of operations which are now done for patients suffering with exophthalmic goiter. Like herniotomy, appendectomy, surgery of the stomach and liver, the technic of operations on the thyroid has been undergoing a wonderful evolution, until now its results are as brilliant as in any other field. The earlier operations in this field were not well done. Too much or too little gland was removed in some cases and in others the parathyroids were removed or their circulation disturbed. Patients were operated on in advanced stages, who already had a thoroughly broken down nervous system, dilated heart, weakened blood vessels or debilitated muscles, and in fact were unsuitable for any kind of successful surgery. Anesthetics were poorly given; patients were poorly prepared; little or no attention was paid to the psychic questions involved; glands were removed when only the blood vessel should have been ligated. The result was that the early operations of all surgeons and most of the earlier attempts at surgical treatment were attended by a comparatively small percentage of improvement and a high mortality. The results in many cases were unsatisfactory and in some cases, where too much was removed or the parathyroids were disturbed, another serious disease was substituted for the one for which the operation was made. All these things have had a very profound influence on the mind of the members of the medical profession and it will take many years of preaching and teaching, combined with a general exhibition of successful surgical results, before the medical man will cease to hesitate to recommend what he considers a very formidable procedure of doubtful value for an incurable disease.

The present status of the surgical treatment of goiter, and especially of hyperthyroidism, probably represents, more completely than almost any other surgical achievement, the prolonged conscientious application of several master minds. While the great body of the profession have been trying this and that new remedy or new plan of treatment, Kocher and a few kindred spirits have kept up a constant attack from every direction until to-day the great Swiss surgeon is able to report a list of 3,000 successive operations on the thyroid with only three deaths to the 1,000. Do we fully appreciate what that means? I fear that those who are still relying on drugs, hygiene and dietetics, and telling each other and their patients old-time stories about the numerous failures and disastrous results of surgery in this field, have failed to keep abreast of the times. Too many of those who attribute the whole group of phenomena to the nervous system fail to appreciate the source of the intoxication by which the nervous system is affected. How anyone can study the anatomy, physiology and pathology of the thyroid without being forced to the conclusion that the basis of any rational treatment must consist in preventing the appropriation by the economy of poisons which can have no other principal source of supply than a diseased thyroid gland, is almost past understanding. That this poisoning finds expression largely in a disturbance of the nervous system does not call for treatment of the nervous system as a primary part of the problem any more than such a patient should call on the ophthalmologist to have

his eyes pushed back or should expect the specialist in diseases of the heart to relieve the tachycardia by the administration of digitalis. The same might be said of the other prominent symptoms of Graves' disease, and, in fact, we all know that far too often such patients are treated for some one or more of the prominent symptoms until the accidental discovery of an enlarged thyroid or the appearance of exophthalmus or tachycardia reminds the doctor that he had failed to make a diagnosis until late in the disease. In this disease, as in every other, its successful treatment depends much upon an early diagnosis, and it is not necessary to postpone such a diagnosis until all the cardinal signs and symptoms are present. One or two may be lacking and a positive diagnosis of hyperthyroidism be made. In some cases there may be little or no evidence of thyroid enlargement and yet the diagnosis be perfectly plain. As soon as a diagnosis is made we should lose no time in instituting curative treatment. These forms of treatment may be considered—medical, surgical and serum. Hygiene and dietetics are not included in specific medical treatment because they have the same applicability to the surgical or serum treatment as to the medical. The surgeon who fails to give his patient the advantage of proper hygienic and dietetic treatment will fail to do his whole duty.

After a diagnosis of exophthalmic goiter is made, ninety-nine times out of a hundred, the doctor will "try medicines for a while," and if he combines these with well-directed hygienic and dietetic measures his patient may improve for a time, or, if the patient be one of the 25 per cent. which will recover spontaneously, he will get well. The problem is very similar to that of appendicitis, and the men who treat the one with medicine use drug treatment for the other, notwithstanding the fact there is no proof that either disease was ever cured by drugs. Abandonment of medical treatment in exophthalmic goiter is slower than in appendicitis, because a fatal issue is usually less rapid, although the percentage of spontaneous recoveries is much smaller and the successful operative treatment of exophthalmic goiter is more recent than that of appendicitis. I take it to be the serious duty of every physician to thoroughly study the surgical methods now in vogue and the results obtained by recent surgical treatment.

C. H. Mayo has reported 405 cases operated on for hyperthyroidism, with 19 deaths. Four of these deaths occurred in the first 16 cases, a mortality of 25 per cent., and three occurred in the next 40 cases, a mortality of 10 per cent. There were 12 deaths in the last 349 cases, a mortality of 3.4 per cent. In 97 of these cases the operation consisted of ligating the superior thyroid arteries and veins. This operation had a mortality of about 1 per cent. (1 case in 97). In 295 cases one lobe and the isthmus of the gland were removed, with a mortality of 18 cases, 7 of which occurred in the first 46 operations. In 14 cases in which one lobe of the gland was removed it was necessary to make a secondary operation for ligating the arteries and veins supplying the remaining lobe. Those requiring secondary operation were attended with as satisfactory results as other cases.

A. Kocher, writing in Keen's Surgery of the results obtained by his father, Theodore Kocher, of Berne, says: "The good results of operative treatment are so prompt that patients are able to return to their work in a relatively short time."

George Crile, writing on this subject in the Annals of Surgery, June, 1908, says:

> We may accept as proven the fundamental proposition that if a sufficient amount of the thyroid gland in Graves' disease be successfully excised relief or cure will follow. Whether the relief or cure be complete on incomplete is dependent upon the correct or incorrect judgment in estimating the amount of gland tissue to be removed. In my earlier cases I frequently erred on the side of removing too little. The relief that follows the removal of a sufficient amount of gland tissue is comparable to the relief from withholding drugs which cause excitation. The extraordinary subjective relief is expressed largely in psychic terms. It resembles most the phenomena of good news in contrast with bad. Buoyancy supplants gloomy depression. The objective signs of improvement follow later. The psychic and metabolic phenomena are closely interwoven.

The treatment is indicated in all cases except those with degenerated heart muscles, irregular pulse, low blood pressure or attacks of delirium.

Kocher has operated on the thyroid gland 3,000 times with a mortality of only three cases in each 1,000. He reports a mortality of 4 per cent. in his last 200 operations for exophthalmic goiter and says that of those operated on 85 per cent. made complete recoveries. This leaves 10.5 per cent. which were either not benefited by the operation or only partially relieved. Similar results have been achieved by a comparatively large number of operators, and have been obtained by improved operative technic which has been largely developed by Kocher, Horsley, Halstead, Eiselberg, Mayo, Crile and others, and as a basic principle consists in approaching each case in an individual way. If the patient is an advanced or rapidly developing case, in which attacks of tachycardia and psychic excitation have become frequent and are likely to be induced by the preparation for operative procedure, the patient is put upon a regime which will limit and modify the liability to such attacks. Here is where the surgeon makes use of the dietetic, hygienic and prophylactic means at his disposal. Crile operates on some cases without the patient's knowledge in order to avoid these phenomena. He secures the consent of the patient to operation whenever in his judgment the proper time has arrived. The plan is described as follows by its author:

> On entering the hospital a non-operative routine treatment is first employed. The object of this treatment is that of minimizing the disease phenomena and studying the case. In addition to the routine consisting of baths, diet, etc., every morning a trained anesthetist who is tactful, goes through the complete form of administering anesthesia under the guise of inhalation treatment. On the ether mask are dropped solutions of volatile oils. . . . Within a few days or a week we usually recognize the cycles of the disease. In the optimum portion of this cycle operation is performed. The evening prior to the operation the patient is given bromids; in early morning if conditions are favorable for operation, a hypodermic of morphin is given. The shades of her room are kept drawn and absolute quiet maintained. In this manner the patient is brought as nearly as possible to a negative psychic state. The operation is done at an early morning hour. At this time the anesthetist repeats the so-called inhalation treatment. . . . Gradually the ether is added drop by drop and imperceptibly the patient passes into the second stage of anesthesia.

In severe cases one or two preliminary ligations of the superior thyroid arteries are made in order to limit the vascularity of the gland and to reduce the amount of thyroid poison taken into the general circulation. This may be preparatory to other ligations or the removal of gland tissue. In pronounced cases, with good hearts, a unilateral excision of the larger and more vascular half of the gland, including the isthmus, is made. In many cases the ligation of two or three arteries and veins give equally good results with removal of half of the gland. The removal of more than half of the gland should not be considered except in rare cases. The operation for hyperthyroidism is more difficult than the ordinary operation for goiter because of the greater vascularity of the gland, but these difficulties only demand a more careful technic, as will be seen by the above statistics quoted from two well-known sources.

To summarize briefly: Cases of exophthalmic goiter in which reasonably early diagnosis is made, that is, before there is irremediable degenerations of the heart muscles and before the nervous system has become permanently unstable by the violence or duration of the thyroid intoxication, can be permanently cured in at least 85 per cent. of cases by a properly planned and properly executed surgical operation. The proper treatment by surgery serves to reduce either the hypervascularity of the thyroid or to reduce the amount of thyroid tissue directly. The character and extent of the operation will depend on the case. In one case only one principle artery and vein at the upper pole may be ligated; in another case all the vessels in the region may be ligated; in a third case the larger half of the gland, together with the isthmus, may be removed, while in certain extreme cases Kocher has planted parathyroids into the shin bone in order to be able later to remove the whole thyroid. Secondary operations in this disease should be frequent, because in a certain number of cases it is impossible to sufficiently reduce the hypervascularity at one operation without subjecting the patient to too much risk. After ligating the vessels on one side or removing half the gland it may still be necessary to ligate one or more vessels on the other side. Patients must be selected with care and those that have already undergone degenerative changes in the muscular, circulatory and nervous systems which would make any operative procedure impracticable should certainly not be advised to have an operation for goiter, and the responsibility of advising operation sufficiently early is directly on those who are in general practice who are consulted early in the cases. In cases subjected to operative treatment at the proper time the mortality is only about 5 per cent., while the chances of a permanent cure are 85 per cent. To quote the words of Lewellys F. Barker, "International medicine up to this time has been utterly unable to obtain results comparable with these." It is the serious duty of every practitioner to become thoroughly informed regarding surgery of the thyroid. The results of these operations are uniformly good and are just in proportion to the reduction of the hypervascularized thyroid tissue. The only thing which can disturb the present firm foundation and rapid adoption of the operative treatment for hyperthyroidism as the safest, most rational and most successful

plan is the development of a serum treatment which will neutralize the thyroid poison.

Since the recent accomplishments of Rodgers and Beebe, of New York, it seems altogether possible that just as the surgical treatment is placed on a firm foundation it will be swept aside by a more successful and more easily applied serum treatment. This is certainly a consummation devoutly to be desired; but until the serum treatment is sufficiently developed for general adoption, we must look to early surgical operation as the most rational method of combating exophthalmic goiter.

The following irregular case of exophthalmic goiter is reported to illustrate the effect of operative treatment:

B. S., single, aged 23 years, teacher in the country; home surroundings comfortable and environment good. She had been teaching about five years. Patient was first seen August 1, 1907, complaining of a general dermatitis which had resisted all attempts at successful treatment and had existed for about one year. It began with itching and burning; then very minute vesicles appeared, the tops of which would be rubbed off. New vesicles would appear irregularly, and between these would be patches of dry scaly eruption. The process began on the outsides of the arms and legs. After this eruption had existed about nine months she began to notice a fine tremor in the hands and later in other muscles, and it was not long until the heart's action began to be rapid. Patient feels sure that she did not notice any undue action of the heart until the tremor had existed some time. Soon she began to be restless and nervous, could not get to sleep at night for several hours and then would wake easily; would cry at every little thing which went wrong and could not concentrate her mind on her work and could not study. She finally had to abandon her work. Shortly before calling on me she had her attention called to a moderate enlargement of the thyroid. At this time the pulse was 120 to 150, there was slight exophthalmus and a slight but constant movement of the left eye. While her usual weight was 140 pounds, she now weighed only 117, notwithstanding the fact that she had an enormous appetite for several months. The bowels were constipated. On account of the uncontrollable appetite, vomiting of food occurred at times. There was moderate dyspnea on exertion and great feeling of weakness and fatigue. On August 13, 1907, the enlarged right lobe of the thyroid and isthmus were removed. The operation was without special incident and healing was rapid. The subsidence of the symptoms due to the hyperthyroidism began soon after the operation and has been continuous but not rapid. The nervousness and sleeplessness were the first symptoms to improve. Almost immediately following operation sleep was normal and there was a return to normal appetite and an increase in weight to 156 pounds at the end of three months and then a reduction to about 140 pounds, which is still maintained. The subsidence of the rapid pulse and tremor were more gradual. The dermatitis was the last symptom to yield. She has been teaching school for a year and seems perfectly well.

BIBLIOGRAPHY

The following literature is of interest in studying the surgical treatment of exophthalmic goiter:

The Thyroid and Parathyroid Glands, by Hubert Richardson.

Diseases of the Thyroid Gland, Keen's Surgery, by Albert Kocher.

The Treatment of Disease, by Reynold W. Wilcox.

Diseases of Metabolism (Trans.), by Julius Salinger.

The Diagnosis of Exophthalmic Goiter, Jour. A. M. A., Oct. 12, 1907, vol. xlix, p. 1235, by Lewellys F. Barker.

Medical Treatment of Exophthalmic Goiter, Jour. A. M. A., Oct. 12, 1907, vol. xlix, p. 1235, by Robert B. Preble.

Thyroidectomy for Exophthalmic Goiter, Surg., Gynec. and Obstet., vol. viii, p. 279, March, 1909, by A. H. Ferguson.

Surgical Aspects of Graves' Disease with Reference to the Psychic Factor, Annals of Surg., vol. xlvii, p. 864, June, 1908, by George Crile.

Modern Surgical Treatment of Exophthalmic Goiter, Illinois Medical Journal, vol. xiii, p. 157, February, 1908, by A. P. Heineck.

Surgical Treatment of Exophthalmic Goiter, Surg., Gynec. and Obstet., vol v, p. 623, December, 1907, by A. P. Heineck.

Surgical Treatment of Exophthalmic Goiter, Jour. A. M. A., vol. xlix, p. 1240, p. 1240, Oct. 12, 1907, by Albert Kocher.
Goiter: Its Surgical Treatment Based on Four Hundred and Seventy-five Cases, ILLINOIS MEDICAL JOURNAL, vol. xi, p. 327, October, 1907, by C. H. Mayo.
Results of the Surgical Treatment of Exophthalmic Goiter, Annals of Surg., v. xliii, p. 335, March, 1906, by B. F. Curtis.
Surgical Treatment of Exophthalmic Goiter, Jour. A. M. A., vol. xlvii, p. 665, Sept. 1, 1906, by F. J. Shepherd.
Thyroidectomy and Exophthalmic Goiter, Annals of Surg., vol. xliii, p. 33, July, 1905, by Frank Hartley.
Report of Operative Treatment of Graves' Disease, Jour. A. M. A., vol. xli, p. 228, July 25, 1903, by T. C. Witherspoon.
Operative Treatment of Exophthalmic Goiter, Annals of Surg., vol. xxxvi, p. 398, September, 1902, by Emmet Rixford.
Operative Treatment of Exophthalmic Goiter, ILLINOIS MEDICAL JOURNAL, vol. xlix, p. 372, February, 1900, by Carl Douffner.
Mortality of Operations Other than Strumectomy in Cases of Exophthalmic Goiter, Amer. Jour. Obstet., vol. lii, p. 367, September, 1905, by B. C. Hirst.
Total Extirpation of the Thyroid Gland, Jour. A. M. A., vol. xxxvii, p. 185, July 20, 1901, by G. F. Cott.
Results Obtained by the Operation of Partial Thyroidectomy in Eight Cases of Graves' Disease, Med. Rec., vol. liv, p. 217, Aug. 13, 1908, by J. A. Booth.
Surgery of the Thyroid Gland, N. Y. Med. Jour., vol. lxxxiii, p. 280, Feb. 10, 1906, by Max Ballin.
Some Experiences in the Operation of Thyroidectomy, Partial and Complete, Surg., Gynec. and Obstet., vol. iii, p. 272, August, 1906, by F. J. Shepherd.
Partial Thyroidectomy, Inter. Jour. Surg., vol xvii, p. 304, October, 1904, by A. B. Andreson.
Personal Experiences in the Surgery of Simple Types of Goiter, Ther. Gaz., vol. xxxii, p. 846, Dec. 15, 1908, by J. M. Wainwright.
Surgical Treatment of Goiter, Amer. Jour. Med. Sci., vol. cxxxiv, p. 183, August, 1907, by M. B. Tinker.

SURGICAL TREATMENT OF APPENDICITIS—THE PUS APPENDIX.

ADDITIONAL DISCUSSION OF THE PAPERS OF DRS. COLLINS AND GREEN, PUBLISHED IN THE OCTOBER ISSUE, PAGES 375-388.

Dr. S. A. Oren, of Lewistown: I am very glad to have heard these papers and the discussions on them. I rise simply to call attention to one or two points. If we, as country physicians, listened carefully to what has been said by our great surgeons and followed the advice given, what would we do? We must not give cathartics to these patients.. Dr. Harris says don't give a cathartic before the diagnosis is made. If you are called to see a patient with pain in the abdomen, "*don't give a cathartic;* don't give opium until you have made the diagnosis." That is what we are told. Imagine yourself called to the country to see a patient who went to bed feeling well, but awakened by vomiting and cramps in the lower part of the belly. You find tenderness all over the abdomen, perhaps, and a bloated condition. We are told we must not give any opiate; we must not give any cathartic. There is not a physician in the country who has not been confronted by that condition time and again. You give the patient a cathartic and a hypodermic injection of morphin, and tell him you will be back in the morning. The next morning the patient is up and feeling well. He had simply indigestion. He had eaten something for supper a little late that did not agree with him, and all that he needed was a little physic to afford relief. When our great surgeons tell us the whole truth, they will tell us that one-fourth or one-fifth of the cases operated on for appendicitis have nothing the matter with the appendix. (Laughter.) Yet they have told us here that the diagnosis of appendicitis is easy. I have been called in consultation with some good surgeons. I was called in consultation with a physician in Chicago to see a relative they were treating. I diagnosed appendicitis. The surgeon looked the case over and concurred with me. An operation was performed a short time after, but there was no appendicitis. (Laughter.) I could go on and cite case after case, similar in character, in which mistakes in diagnosis have been made, and it is all nonsense to say that we should not give a cathartic or a dose of opium or morphin when a patient is suffering intensely until the diagnosis is made for fear of masking the symptoms. (Applause.)

Dr. Collins (closing the discussion on his part):—Dr. Deaver, during his remarks, placed no time limit on the use of the scalpel, but before he completed his remarks he had placed a limit and admitted that his mortality increased after fifty hours. The only difference between us is that he sets the limit farther ahead than I do. Dr. Deaver condemned the use of the thermometer. I still insist that the record of the thermometer is valuable during the period where I advised its use, namely, the first thirty-six hours. The cardinal symptoms of a beginning appendicitis are pain, vomiting, tenderness, and a rise in temperature. After the appendix has become perforated, I will agree with Dr. Deaver that the record of the temperature is of less value.

Dr. Harris condemns the dividing of an attack of appendicitis into periods of twenty-four hours. How did we come to so divide these attacks? During the few years following the inauguration of the surgical treatment of appendicitis surgeons, in tabulating their results, found that patients operated on during the first twenty-four hours of the attack got well. After that time the mortality began to increase up to the fifth day. And this is the way this division of appendicitis into periods came into the literature and discussions. I do not believe that these tabulated results have yet lost all their value. My own experience teaches me that the conclusions drawn from them are still true. Perhaps, when my experience has equaled that of Drs. Deaver and Harris, I may also lengthen the time during which I would operate for appendicitis or peritonitis, but that time has not yet arrived. We should keep in mind that our primary object should always be to save the patient's life, and I am very sure that if all the surgeons of this country began to operate during the first fifty hours of the peritonitis that the mortality following operations for appendicitis would be very greatly increased.

Dr. Fuller thinks that those surgeons who advise against the use of opium until the diagnosis is made have not yet suffered from appendicular pain. I may say in reply that I have had appendicitis and have had my appendix removed, and the only morphin or opium that I received during the entire attack was a preliminary dose of 1/6 grain of morphin and 1/100 grain of scopolamin as a preliminary before the anesthesia. It is refreshing to hear Dr. Billings, a medical man, give us still another indication for the surgical treatment of appendicitis.

Dr. Green (closing the discussion):—In regard to the administration of opium, if one resorts to gastric lavage and puts on an ice-pack, oftentimes he can get along without the use of an anodyne, because it is the peristalsis and distention of the abdomen with gas that cause pain. With gastric lavage and the application of the ice-pack, peristalsis is done away with, and you can get along very well without the use of opium.

REPORT OF A CASE OF BRAIN TUMOR, WITH SPECIMENS OF BRAIN AND TUMOR*

C. B. Horrell, M.D.
GALESBURG

The patient was a male, age 47. His early life was on a farm. The family history was good. He was married, father of two very healthy girls, 14 and 11 years old. He has always been a healthy man. In 1889 he fell from a scaffold about 12 or 14 feet and dislocated his spine, which he reduced by himself upon getting out of bed some ten days after the injury. At the time of his falling from the scaffold he alighted on a pile of bricks.

* Read before the Fifty-Ninth Annual Session of the Illinois State Medical Society, Quincy, May 19, 1909.

There was no injury to the head noticed by the family or attending surgeons. One leg became partially paralyzed some time after, but by bathing with hot water and massage the sensation and motion were restored and a physician was not called. No trouble of a serious nature occurred, but for a few months he called his left leg his game leg. He remained quite well and for about 13 years attended to his business of a hardware dealer and plumber. He then took a position as traveling salesman for tin-plate works and hardware specialties for about four years.

His first indisposition, in April, 1906, was entirely in the lumbar region, about the seat of injury 17 years before. It was simply pain, without effect upon his locomotion. It did not last long and was diagnosed "lumbago" by the physician called. He seemed to recover generally, but had some weakness of the spine, and another physician examined the urine and said there were symptoms of Bright's disease, but this did not develop. He still continued his work on the road and in June, 1906, he had an attack of serious sickness of the stomach and congestion of the brain and severe headache, and these attacks recurred in from three to five weeks and gradually became worse. His face would become very red, almost purple; eyes congested, and an epileptoid condition appeared without convulsion. He never became unconscious in these attacks till February, 1907.

In the autumn of 1906 the first symptoms of interference in walking was noticed, gradually growing worse. He was able, however, to walk from his home to the downtown district, a distance of five blocks.

In July, 1906, while still on the road, and after his first severe gastric and headache attack, and following the second similar attack, he noticed marked failure of eyesight, and within a fortnight had his eyes fitted with glasses three times, each fitting seeming to relieve him for a day or two. The eyesight gradually failed, and in February, 1907, with his attack of vomiting and headache, he for the first time became unconscious and remained so for about 48 hours. After this date, from three to five weeks apart, similar attacks of vomiting, headache, and unconsciousness would occur, lasting almost invariably about 48 hours. In each attack, just preceding his return to consciousness, there would be very free diaphoresis, some pallor of the face, and gradual return of consciousness. Some improvement of vision seemed to exist as compared with the vision just preceding each attack.

From August, 1900, there was gradual failure of eyesight and the eyes had a peculiar staring, vacant look. After the severe attack in February some hesitancy and difficulty in speech was noticed for the first time. After recovery he would talk well, but difficulty in speech gradually grew worse as the case advanced. He had little or no medical attention from August, 1906, to February, 1907, being mostly under the esthetic care of one of our dearly beloved co-laborers of the osteopathic cult. Please bear this in mind as to time and treatment. In February the first severe or unconscious attack called for a reputable physician of our city, who satisfied himself that the probable trouble was specific, and

made a diagnosis of "gumma," and put him on large doses of iodids, which was continued for eight to ten weeks with no relief.

I was first called into the case the latter part of April, 1907, and found the patient just recovering from one of his unconscious attacks and able, with the assistance of his wife, to give me very closely the above history. At the time the patient was under no physician's care, but was very ably attended by his wife, who was a very good nurse, and also very intelligent in a general way, and especially well posted with regard to cerebral geography and symptoms likely to occur from tumor pressure or traumatism. Many of her close questionings were almost embarrassing to an ordinary practitioner, of which large aggregation I am simply a unit. I found much gastric disturbance had existed during the month previous to my first call and I was satisfied that much of the stomach trouble was the usual result of full dosage of the potassium iodid. Upon its withdrawal and administration of strychnia and stomachics this symptom disappeared, save at such times as he had his unconscious attacks. At this time he was almost blind, could discern daylight from darkness, and could tell when the gas was lighted in his room. Once or twice he said he could dimly outline my face and body at a short distance.

In May, 1907, he described the dress of his wife as blue, the last glimpse of color ever admitted. In the few weeks following, and especially after one of his long continued epileptoid spells, he could dimly see the outline of anyone passing before him, but after September, 1907, he was totally blind to the date of his death, July 16, 1908.

In assuming charge of the patient I did not make a diagnosis for several days, and not until Dr. R. C. Matheny made an opthalmoscopic examination and report negative as to syphilis and a fine picture of choked disc. I then ventured the diagnosis of a basal brain tumor and gave the opinion that it was non-operative. By my first prescription and getting the patient's stomach in good condition I seemed to win confidence and an opportunity of studying his case for over a year, about 15 months, and found it of much interest combined with mystery.

In July, 1907, Dr. J. F. Percy was called in consultation as the surgeon, and he agreed with me in the main in diagnosis and prognosis, with the exception of saying that possibly a large trephining might expose the trouble and relief be found, but it was so uncertain and the possibility of not withstanding the shock so great that the operation was objected to by the wife and abandoned. The patient said that percussing the head caused a little pain. I am not absolutely certain, but my recollection is that the pain was complained of when the percussion was on the opposite side of the head to the location of the tumor, according to the findings of the autopsy. Dr. Percy will probably remember. I have since wondered if the sensation might have been by *contrecoup*.

I was making calls only once or twice a week—sometimes at longer intervals between visits—and could see that he was failing in his co-ordination and ability to walk, but was eating and sleeping well, and was

hopeful of my treatment, as there was (save at his bad spells) a comfortable degree of good feeling. In October, 1907, Dr. Hugh T. Patrick of Chicago saw the case with me and gave about the same diagnosis as I have already referred to, that of brain tumor of some kind, probably malign, and possibly at the base of the brain; at least, brain tumor and non-operative.

In the short time allotted to this paper it is impossible for me to enter into the etiology or pathology of brain tumor, nor to undertake a classification of them. I have not the special qualifications for such an undertaking anyway, but hope these topics will receive some consideration in the discussion. My object is to give as plain a history of this, to me, very interesting case, which is not, as I see it, a classical case in symptomotology, and yet the postmortem exhibit is specifically so. From Church and Peterson I quite briefly: "Of all brain tumors, tubercle furnishes the largest proportion, and sarcomatous growths are next in frequency. Usually they present the distinctive and important character of being more or less encapsulated, and sharply separated from the brain tissue, from which they can therefore, if accessible, be easily enucleated. As a rule they are outgrowths of the cranial dura, or periosteum, but the majority of them are situated in the basilar region involving the brain axis. They are of rapid growth, and in a given case furnish pronounced, persistent and uniform symptoms." My case you will observe did not. There was some uniformity, but not persistent symptoms, especially as to vomiting.

Glioma is peculiar to nervous structure and is an infiltrating tumor, non-operable from its nature, and carcinomata are usually found within the brain substance through metastatic process from a primary cancerous growth in other organs—the breast, orbit, etc.—and are very vascular and practically inoperable. With regard to the eye symptoms in the case in hand, I had the examination made for the purpose of excluding or proving existing syphilis, as well as hoping for aid in locating the pressure. Church and Peterson say: "It must be borne in mind that vision may not be greatly disturbed when the discs are distinctly choked and their examination should never be neglected." This general symptom of brain tumor is very constantly found in growths involving the cerebellum, corpora quadrigemina and the brain axis. It therefore has slight localizing value and should be employed for this purpose.

Attacks of vomiting, usually called cerebral, without fermentation and nausea, are common. In the case before us there was always fermentation and the breath most foul and offensive, and no vomiting occurred except at intervals of three to five weeks, and food was taken with impunity and relish. Vomiting, like choked disc, is most frequent in tumors involving the cerebellum, especially the middle lobe and the corpora quadrigemina. This symptom in my patient was an indication for diagnosis and localizing the tumor.

In a case of suspected brain tumor a number of problems present themselves: (1) Is there a tumor? (2) Where is it located? (3) What is its size? (4) What is its nature? and (5) Is it operable? This

proposition, therefore, to me, an ordinary "Internal Medicine" man, was a somewhat serious matter for consideration. Our best special authorities assert that above 90 per cent. of brain tumors are inoperable, and, unless growth be of specific character, but little improvement may be anticipated through therapeutic agents. Please note again that from August, 1906, to February, 1907, the patient had no scientific attention and was entirely under the care of an osteopath. Previous to this time he had been seen by a regular physician only once or twice, which in an apparently healthy man gave no opportunity for study and serious diagnosis. The time lost from August, 1906, to February, 1907, I think was the crucial period in this history, and, had he fallen under the charge of a neurologist, his tumor would probably have been located and an operation have saved his life and placed him with the specially favored 7 per cent. to 10 per cent. of operable cases.

The lateness in the history of this case of a call of a regular or special physician, with the incomplete history and far advanced pathological condition, with the eye symptoms, vomiting and absence of serious extremity paralysis, I believe, are largely accountable for the surprise which the autopsy gave me and my associates, as it exposed a large tumor, having its origin from the dura, displacing a vast area of the cerebrum by pressure. It would have furnished a beautiful case for operation if properly located early in its history, and would have made it impossible for me to present this most interesting specimen for your inspection and discussion.

Under the circumstances I believe all was probably done that could be accomplished at so late a date in the case history. But may we not learn a lesson of study and take care to immediately refer all cases of suspected brain tumor to a neurologist and to a sanitarium where competent and specially experienced men may assume the responsibility and offer relief if it can be secured? Care in a diagnosis is, therefore, the lesson hoped for in this report.

The pathological report of tumor by Dr. Peter Bassoe of the Neurological Society of Chicago is an endothelioma, with concretions called psammoma.

DISCUSSION.

Dr. Frank P. Norbury, of Jacksonville:—There has been a remarkable advance during the past few years in the diagnosis and treatment of brain tumors. The work of Cushing, Fraser and Murphy, in this country, of Horsley, Ballance and others in Europe, indicates the possibilities which await surgical interference as a relief measure, especially in tumors of this type.

The first consideration in the study of a brain tumor is to group the symptoms, giving value to each individual symptom, and then to the group as a whole. The eye symptoms must be interpreted early. While they pertain to the intracranial disorders as a whole, yet the optic neuritis either singly or in combination must be considered as general pressure symptom as indicated in this case, and shows something is going on that should be investigated.

All of the symptoms pointed out in this case, I think, possibly could have been elicited earlier. While it is true latency in development is a feature of brain tumor and it is possible to find only on autopsy the existence of the tumor; yet the symptoms detailed by the author were of value as to the existence of an intracranial lesion and suggested tumor. An exploratory operation, or at least a de-

compression operation would have been justified as a relief measure from the symptoms present. Cushing has demonstrated the value of the operation, and I am inclined to believe that we do not fully appreciate this advancement in surgical relief.

During the past two years I have had nine cases of brain tumor under observation, five of which came to operation. Three autopsies were made. Only one case showed failure in localization and only in one was there a difference of opinion as regards the advantage of surgical relief. Recently I saw a case with Dr. L. C. Taylor, of Springfield, which was non-operable by reason of its localization, but even in such cases sometimes the decompression operation may give relief. Another case, pontine angle, localization, which I saw this winter, possibly could have been benefited if operated on when the lesion first made itself known over a year ago.

Dr. J. B. Murphy operated on a case for me. Dr. Patrick saw the case in consultation, confirmed the localization, etc. Relief was secured but the recurrence of the lesion (sarcoma) subsequently caused death. Dr. Fraser, of Philadelphia, operated on two cases for me, one of which was under the observation of Dr. Chas. K. Mills. This is the case where no apparent lesion was found. We need to study general symptoms, special symptoms and get a more comprehensive idea of localization and more belief in surgical exploration. The problems are both neurological and surgical and it is to surgery we look for relief. American brain surgery leads the world.

Dr. Arthur Dean Bevan, of Chicago:—I have been much impressed comparatively recently with the ability of the trained neurologist to locate, with a good deal of certainty, the position of a brain tumor. I was much impressed with that yesterday morning when three men—Dr. Wilder, an oculist; Dr. Koess, on internal medical man, and Dr. Rothstein, a neurologist—located with a good deal of certainty a tumor in the cerebello-pontine angle on the left side. The location was so definite that I was enabled, with an opening about an inch and a half in diameter over the left hemisphere of the cerebellum, from their location, to introduce, first, my little finger (gloved) as far as I could from the opening in the skull down to the tumor, to locate the tumor with my little finger, and with the index finger shell out the tumor, which proved to be a sarcoma. I was very much impressed with the great certainty with which this diagnosis was made. I think the case which has been reported here to-day and the one which I cited are strong arguments in favor of having trained men make these diagnoses.

Dr. Hugh T. Patrick, of Chicago:—I am very sorry indeed, owing to circumstances which were not within my control, that I was not present to hear Dr. Horrell's paper. However, I remember the case. Not having heard the paper, I do not see how I can discuss it, except in a general way, but since the chairman has asked me to say a few words I will do so.

While the early diagnosis of brain tumor is sometimes exceedingly difficult, it is also true that the earliest localizing signs are the most reliable. The late localizing signs of brain tumor are apt to be misleading, because as the tumor grows larger there are remote effects due to pressure. The dynamics of brain tumor, if one may use such an expression, is a very peculiar thing. A tumor that has been growing for some time, or growing rapidly, may produce symptoms simulating or exactly like signs due to compression or involvement of the brain at a considerable distance from the growth. So it is the earliest localizing signs caused by the tumor itself in its own locality which are valuable for the clinician. For instance, there is a whole table of differential signs between a frontal tumor and a cerebellar tumor. The possibility of confusion looks absurd upon the face of it. That a tumor of the frontal region should have a set of symptoms entirely similar, almost identical with those produced by a growth beneath the tentorium and at quite the opposite pole of the cranial cavity, seems impossible, but such is the case. These similar signs produced by tumors at remote localities are due to transmitted pressure and to the accumulation of fluid in the ventricles. The early irritative signs of tumor are much more valuable than the paralytic signs; that is, localized pain, irritation of craniel nerves, or irritation of the

cerebral cortex itself are the localizing signs of value. The paralytic signs, whether they be indicative of paralysis of the cranial nerve, the cutting out of function of the cerebral cortex or any sort of paralysis, are misleading. Notably so are the late cranial nerve signs, and of these the most misleading of all is paralysis of the sixth nerve, the abducens, supplying the external rectus of the eye, which is absolutely of no localizing value at all, because the nerve runs a long course, is slender and delicate, and may be paralyzed by a tumor at any place within the cranial cavity. In the case of a tumor which has progressed to the stage which this tumor had when I examined the patient, the stage of development of optic neuritis, optic atrophy, total blindness, to a point where the tumor is practically non-progressive, with very little headache, no vomiting, not much dizziness, and more or less paralysis, not particularly progressive, while the localization may be easy it is apt to be difficult, because the tumor having been there a long time and having reached a considerable size, may cause symptoms from many locations in the cranial cavity. The case cited by Dr. Bevan is interesting, but it is not one in which neurologists would particularly pride themselves on their skill in localization, because that is one of the few localities in the brain where the localization is exceedingly easy and can hardly be missed if one knows anything about cranial topography and can get the history. In these cases of tumor in the cerebello-pontine angle, the progress of events is, first, one of irritation of the acousticus or facial, or both, then one of pressure on the pons or cerebellum, and then instead of an irritation of the seventh or eighth facial paralysis, with increasing nerve deafness; then the added cerebellar signs; so that the diagnostic points of these tumors have come to be a sort of A, B, C in cerebral localization. It is the tumors which produce none of these progressive cranial nerve signs, and tumors in the so-called silent areas of the brain, which cause the greatest possible difficulty. I may say that in the majority of cases of brain tumors, taking them as they come, say a hundred in succession, perfect localization is absolutely impossible; although the more one knows about them, and the more carefully one studies these tumors, the fewer mistakes he will make, and the more confidence he will have in localization.

Dr. Horrell (closing the discussion):—I have nothing to add except this, that probably this picture may impress us all with what to me appears to be of very great importance, namely, early diagnosis and early reference of the case to a specialist.

THE ACTION OF THE COAL-TAR ANODYNES.*

BERNARD FANTUS, M.D.
CHICAGO.

Twenty-five years ago the substances under discussion this evening were quite unknown. To-day they rank among the drugs of first importance, if the frequency with which they are used serve as criterion. Most prominent among them are acetanilid, acetphenetidin and antipyrin. While at first their antipyretic action, unequaled by any previously known agency, rivited the attention of mankind, their dangers when used for this purpose soon became apparent, so that at present they are mainly used because of their pain-relieving power. Therefore the name "coal-tar anodynes" seems to me much more appropriate than the older titles, "coal-tar antipyretics." As the opinion of the medical profession is quite well crystallized in regard to the use of these substances as antipyretics, which is now limited to minor cases of fever and in the

* Read before a Medico-Pharmaceutic Joint Meeting at the West Side Branch of the Chicago Medical Society, Dec. 17, 1908.

severer forms as adjuvant merely to the use of hydrotherapy, I desire to devote this paper exclusively to a study of their anodyne action.

In pain-relieving power the coal-tar anodynes are not as omnipotent as is morphin. They undoubtedly relieve pain in an entirely different manner. Morphin produces its first effects in the psychic sphere, and the best explanation of its anodyne action is that it lessens the appreciation of sensory stimuli. The coal-tar anodynes, on the other hand, affect the nervous system in an entirely different order. They act on subcortical centers much earlier than they do upon the cortex. Psychic phenomena do not occur until after marked disturbance of the functions of the basal ganglia and of the medulla has been produced, showing itself in their antipyretic action and in their marked tendency to produce collapse. I am tempted to formulate the theory that their anodyne action is likewise due to influence upon the structures at the base of the brain, for they evidently do not affect the cortical end-station for sensory stimuli as morphin does, nor do they act upon the lower sensory neuron, their action upon the spinal cord and its adnexa being quite subordinate. Therefore, they most probably act upon some point in the intermediate sensory neuron, perhaps upon the optic thalamus, the great sensory ganglion at the base of the brain.

The pains for which the relief of these substances have been found especially useful are those that originate from nutritional disturbances within the nerve structures themselves, neuralgic pains in the widest sense of the word. They relieve many different types of headache, trifacial neuralgia, intercostal neuralgia, sciatica, certain types of gastralgia and the lightning pains of locomotor ataxia. The aching of head, back or limbs accompanying febrile disturbances is likewise relieved by these agents, often in doses that are insufficient to affect the temperature. While useful against the pains of mild neuritis, they fail in the pains of severe neuritis, as they fail in inflammatory pains in general, as well as in pains due to gross anatomic disturbances.

It must be clearly understood, however, that the coal-tar anodynes are mere symptom medicines, that is, that they temporarily relieve the symptom (pain) without improving the underlying morbid condition. Indeed, many a time the underlying condition is made worse, just because the pain is relieved and nothing is done to relieve the cause of it. Take, for instance, a patient who suffers from headache due to overfatigue—a person who works or plays too hard and rests too little. These remedies relieve the pain and permit him to keep on in his self-abuse until finally his whole nervous system is wrecked, until he suffers from an advanced and confirmed case of nervous exhaustion. Had his headaches not been relieved they would have compelled him to rest, and the ultimate breakdown would have been averted. Druggists, remember: pain is a danger signal. Pulling down a danger signal on a railroad is a crime. Is it less of a crime to pull down a danger signal that an intelligent physician might use to avert a human wreck?

Furthermore, these remedies are not free from danger. There is danger from overdose as well as from overuse. Overdose is not merely a

question of quantity, but also of tolerance of the system. While the doses given in the text-books are safe enough for normal individuals, they may be fatal for patients suffering from certain diseases. A large number of deaths is now on record that resulted from doses of the coal-tar anodynes that are usually considered safe. The most prominent symptoms were cyanosis and collapse. It is true, in most of these cases, the individuals that showed the intolerance were abnormal, owing to heart disease, kidney disease or other grave organic disturbances; but the danger is just as great, for it is the sick and not the well that take these drugs. As the druggist does not know whether the hearts and the kidneys of his patients are sound or not, he should be prohibited by law from dispensing these potentially homicidal drugs without a physician's prescription.

As is well known, continued use of these medicines undermines the system. At present the dangers from prolonged use of acetanilid are best known; it is, however, certain that all the other agents of this group, differing as they do from each other quantitatively rather than qualitatively, are capable of producing similar results. The symptom-complex of chronic acetanilid poisoning, which is so well given in connection with the case reported by Drs. Herrick and Irons (*Journal A. M. A.*, Feb. 3, 1906, p. 351), should be more familiar to physicians, as they would by it be able to fathom many a puzzling case. When a patient presents cyanosis and dyspnea without adequate explanation for these symptoms by the condition of heart, lungs or other organs, the suspicion of acetanilid poisoning is justified. If the blood examination reveals a secondary anemia with degenerate and nucleated red blood corpuscles, or a polycythemia, and if the urine has a dark color or darkens on standing, the suspicion is strengthened. The proof can be obtained by an examination of the urine for paramidophenol, which is easily recognized by the so-called indophenol test, performed as follows: The urine is boiled for a few minutes with one-quarter of its volume of concentrated hydrochloric acid. On cooling, a few c.c. of 3 per cent. carbolic acid solution are added, and then hydrochlorite of calcium or dilute chromic acid solution. Amidophenol gives a red color, and on adding an excess of ammonia the color changes to blue.

The ease with which anyone can on his own solicitation obtain these powerful poisons is appalling. Patent medicine advertisements actually force these agents upon the public. Druggists promote their consumption by counter-prescribing and the pushing of "just-as-good" preparations of their own; and the careless doctors who use these agents in lieu of and without treatment of the cause of the complaint are aiding and abetting this great evil of our times. It must not be understood that I condemn the use of these agents altogether. Properly applied and controlled by supervision of a skilled physician they are a blessing to humanity. It is only when they escape this control that they become a blight and a curse.

How are physicians to choose among the bewildering number of contestants for medical favor belonging to this group? Chemistry and

experimental pharmacology, which are responsible for their production, also furnish the key to their selection. The substances in use at the present time may be readily subdivided into two sub-groups: the acetanilid sub-group and the antipyrin sub-group.

The bodies of the acetanilid sub-group owe their activity to the formation of paramidophenol in the tissues. The chief difference between them is the rapidity with which the formation of this substance occurs. Those that yield paramidophenol rapidly have the promptest and most powerful action; they are, however, also more fleeting in their effects and more dangerous by having greater tendency to produce blood destruction and collapse. Such agents are acetanilid and exalgin. As 0.30 Gm. (grs. 5) of acetanilid have produced death, the dose of 0.25 Gm. (grs. 4), given in the U. S. P. as the average dose, should also be the maximum initial dose. Exalgin, which is methyl-acetanilid, is even more dangerous than acetanilid, and 0.20 Gm. (grs. 3) should be considered its maximum dose. It would probably be best, however, to discontinue entirely the use of acetanilid and of exalgin, as we have succedanea for these that are much safer and nearly as efficient.

The phenetidin compounds, which yield paramidophenol much more slowly, are certainly much safer. Among these acetphenetidin, heretofore known as phenacetin, probably yields maximum therapeutic effect with minimum toxicity. Its comparative insolubility is the only objection to its use. When, however, the solubility is greater, as in lactophenin, the toxicity is at once increased. Acetphenetidin is a remarkably safe substance. No fatal case of poisoning in human beings is on record; however, 1.50 Gm. (22½ grains) of it are reported to have produced collapse with cyanosis in a woman. The pharmacopeial average dose of acetphenetidin given at 0.5 Gm. (grs. 7½) is unnecessarily large as an initial dose. I have obtained satisfactory anodyne results in cases suitable for these agents with doses of 0.10-0.20 Gm. (grs. 1½ to 3), which may be repeated every hour for two or three doses, if necessary. Owing to its slight degree of solubility, this substance is best prescribed in powder form, or the powder enclosed in gelatin capsules or cachets. Formation of pill mass or compression into tablets is liable to result in a worthless insoluble lump.

The phenetidin compounds recently thrown upon the market by chemical enterprise are so numerous that it is practically impossible at the present time to decide authoritatively their conflicting claims, for each is launched as the safest and the best that was ever discovered. It is, however, quite a safe proposition that, if acetphenetidin is unsuitable, the substitution of a closely allied acid radicle for the acetyl will make very little difference. Often the difference is not at all in favor of the new agent. For instance, 1.0 Gm. (grs. 15) of citrophen, one of these highly lauded substitutes for acetphenetidin, has produced cyanosis and collapse.

The antipyrin sub-group is derived from phenylhydrazin, as the acetanilid sub-group is derived from anilin. Phenylhydrazin is another blood poison like anilin. The main advantage of antipyrin lies in its

solubility, which, however, makes it quite an irritant when applied in full concentration. Because of its irritant properties, antipyrin should never be prescribed in capsule form. It lends itself very nicely to prescribing in solution. As it is very generally incompatible, it is better prescribed alone, unless the proposed combination has previously been carefully investigated. The U. S. P. average dose of 0.25 Gm. (grs. 4) is certainly a much safer dose than the larger doses advocated by many other books.

Numerous combinations of antipyrin with other powerful substances are upon the market: e. g., hypnal, which is chloral and antipyrin; salipyrin, which is salicylic acid and antipyrin; acetopyrin, which is aspirin plus antipyrin. It seems better to use these active drugs in their simple form, and to administer them in the desired proportion, instead of using a combination, often without knowing the relative amount of each of the ingredients. For instance, all the salicylic acid derivatives of the coal-tar anodynes suffer from the fundamental fault of containing far too little salicylate to be of any use in acute articular rheumatism.

Perhaps the only antipyrin derivative of real importance is pyramidon, which is an amido-antipyrin. It is claimed to be three times as powerful as antipyrin, to be devoid of gastric irritant action, though it is slower, requiring sometimes two hours for its action to declare itself. It is, on the other hand, more durable in its effects. It may be that the relation of pyramidon to antipyrin is similar to that of acetphenetidin to acetanilid. If so, it may be a remedy of real value. Its dose is stated to be from 0.30 to 0.50 Gm. (5 to 8 grains). I have found half as large doses efficient. It may also be used hypodermically in doses of 0.6 to 0.12 Gm. (1 to 2 grains): e. g., in sciatica, injected into the sciatic nerve once or twice daily.

In conclusion, it may be profitable to study the pharmacology of some of the popular combinations. First and foremost in popularity is the combination with caffein, usually in the proportion of one part of caffein to three parts of the coal-tar derivative. The caffein is supposed to antagonize the collapse action. That it is not very successful in this respect is evident from the fact that just such combinations as are found in bromo-seltzer, antikamnia, etc., have repeatedly produced death. Perhaps the main reason for the popularity of this combination lies in the fact that caffein has a specific action in temporarily overcoming fatigue and the symptoms produced by it, such as the aches and pains of nerve-tire. In just such pains the coal-tar anodynes are also of value. A combination of the two undoubtedly acts with greater force in cases of this kind than either remedy alone. We must not forget, however, that caffein produces wakefulness. Therefore this combination must not be used in the thoughtless manner in which it has so often been employed in the past. It is especially indicated in fatigue disturbances; it is especially contraindicated in insomnia and in conditions of excessive nervous irritability. Combination with a bromid is likely to be of advantage in the last mentioned condition.

Alkalis are often added to acetanilid in the belief that the remedy is thereby rendered more soluble, thus insuring prompter action. Puckner

(*Journal A. M. A.*, Oct. 13, 1906) has shown that such addition does not increase the solubility. It is conceivable that the combination with sodium bicarbonate might be of value in gastralgia; a good deal more bicarbonate would, however, have to be added than is contained in the compound acetanilid powder of the U. S. P. or in similar proprietary combinations. Ammonium carbonate has been added for the double purpose of solvent and heart stimulant. As solvent it is useless, and its prompt but fleeting action must have disappeared long before the depressing action of the acetanilid develops; hence, when wanted, it would not be there.

Combinations with salicylates, which are closely allied to these agents both chemically and pharmacologically, are remarkably efficacious in pains of rheumatic nature. More salicylate would, however, have to be added than is contained in most of the synthetic preparations on the market. It may be noted here that sodium salicylate forms a pasty mass when rubbed with antipyrin, hence could not be dispensed in powder form or in capsules. Acetphenetidin, on the other hand, may be mixed with salicylate, preferably acetylsalicylic acid (aspirin) and administered in form of powders, capsules or cachets.

The difference in point of attack of morphin and of these agents suggests that a combination of the two might act very efficiently, which is asserted to be a fact by Lambert (*Journal A. M. A.*, Dec. 21, 1907), who states that the combination of acetphenetidin, 0.30 Gm. (grs. 5), and morphin, 0.005 Gm. (grs. 1/12), is four times more efficient an analgesic than either remedy alone.

STUDIES IN CONTEMPORARY WORKMEN'S COMPENSATION.*

SECOND PAPER.

W. H. Allport, M.D.

CHICAGO.

IV.

The French Laws.[1]

The old French Code Civile based recovery of damages for industrial injuries upon the ancient theory of negligence, and the burden of proof lay upon the injured workman.

In 1880 Martin Nadaud, in the Chamber of Deputies, sought to have this procedure reversed, but the effort was unsuccessful. In 1883, Felix Faure, afterward president, introduced in the Senate a project of obligatory insurance against *risques professionnels*. This project was based, without doubt, on the measures then pending in the Reichstag, for not

* The synonymous terms "workman" and "employé" are used in the sense defined by the English Workmen's Compensation Act of 1906, q. v. The term "compensation" is used in the sense of a *solatium* for injuries received, and not as a wage for service performed.

1. E. Levasseur: Question Ouvrieres et Industrielles en France sous La Troisieme Republique, pp. 463-474. Green Bag, No. 18, 1906, p. 225 et seq., B. H. Connor.

only was the general direction of the law the same, but in many clauses the wording was nearly identical. Faure's project, after many vicissitudes, both in Senate and Chamber of Deputies, failed of enactment. In 1885, M. Rouvier, then minister of commerce, introduced another abortive project. Other efforts, all unsuccessful, were made in both chambers, in 1888, 1890, 1895 and 1897.

Finally, eighteen years after Nadaud's first effort, and thirteen years after the first German law went into effect, the French legislature passed the law of April 9, 1898. Debate was long continued as to whether the law should be based on the reversal of the burden of proof originally suggested by Nadaud, on compulsory insurance, as suggested by Faure and exemplified in the German system, or simply on the responsibility of the employer for *risques professionnels*. The last method was finally selected, both because it was more sure of reaching the greatest number of cases, and because it was less likely to produce disarrangement of the industrial interests of the nation, than a law burdening employers with an obligatory insurance tax.

Under the law adopted, the industry creating the risk is chargeable with the injury—*accident du travail*—whether due to employer, vice-principal, employé or coemployé; excepting only after such accidents as can be plainly demonstrated to be due to inexcusable negligence of the workman (principle of *l'indemnité forfaitaire*), and not to any inherent risk of industry. Under the last-named condition, the judge can reduce or forfeit the indemnity. All actions for recovery in this class of cases are barred, except under this law.

The law was modified in 1902, 1905, and finally, in 1906—in effect Jan. 1, 1907. It comprises 4 titles and 34 articles, and applies to all machine-driven industry, except such as is moved by man or animals, and provided the work of the injured employee is interrupted for more than four days.

Two thousand four hundred francs is the maximum full earning capacity which can be used as the basis of compensation; any excess of earnings beyond f2,400 is computed at one-fourth of the excess.[2] For total and permanent disability, the workman receives a pension equal to two-thirds of his salary, computed as above. For partial or temporary disability, he receives one-half of the reduction in his wages caused by the injury. Cost of surgical attendance is paid by the employer.

In case of death, f100 is allowed for funeral expenses; the wife secures a pension of 20 per cent. of the estimated wages of the deceased and the orphans receive 40 per cent. for the loss of one parent and 60 per cent. for the loss of two. The dependent relatives of a workman without wife or child may receive 30 per cent.

All pensions are payable quarterly and cannot be assigned or seized.

Revision of a pension is allowed after three years, on proof of change in the degree of the disability. The payment of a pension is guaranteed, either through turning over the capital necessary to produce it, or through insurance—approved by the state—in mutual insurance socie-

2. Cf. the German law.

ties or unions of employers, the former within the large establishments and participated in by both employers and workmen,[3] the latter similar to the trade groups of the German empire. These insurance contracts, however, are very strictly supervised by the government, and any waiver of rights is absolutely barred.

Certain objections have been made to the laws as last modified: 1. The law does not specify exactly what are—and what are not—industrial accidents. This failure of exactness has given rise to many disputes over hernia, appendicitis, varicocele, piles, varicose veins, etc.[4] 2. It makes no provision for accidents producing injuries not resulting in loss of earning capacity, such as disfigurements, deformities, painful conditions, etc. 3. It tends to discriminate against the employment of married men through obliging employers to pension their survivors.

Statistics are not yet available on which to base an opinion of the success or failure of the law of 1906, but the operation of the earlier laws has been eminently satisfactory, both to masters and workmen, except in the few details which have been recently altered.

"There is not, perhaps, an example," says M. Bourguin, "in the history of legislation, of a movement so rapid and so unanimous as that adopting the principle of responsibility of industry for professional risks. Since the German law of 1884, and above all since 1900,[5] all of the industrial states of the civilized world" (!) "have incorporated into their codes some recognition of this obligation of the product to the producer."

V.

The German Industrial Accident Insurance Law.[6]

Had we undertaken to follow closely a logical sequence in tracing the development of the various phases of workmen's compensation for industrial accidents, we should have started with a review of the German laws. But to the American mind—arrogant and direct, yet timorous and untrained; intensely conservative and provincial, yet ignorantly boastful of progress; wedded, in short, to a distorted and selfish individualism—such a brief study as we have just made, of the comparatively simple and conservative compromises of the English and French legislation, would seem to furnish a less startling approach to the technical and far-reaching statutes by which German Europe has escaped from the obsolete formulas of common law.

It would carry us too far from our present subject to discuss at length the virile influence which the social philosophy taught by Hegel, and applied by Marx and Lassalles, has had upon German politics and legislation from before the time when our own Carl Schurz was imprisoned and driven from Prussia because of his participation in the movement of 1848-49, down to the decade of 1880, when the old Kaiser, guided

3. Such as was recently organized by the International Harvester Co. of the U. S., and not unlike the Beneficial Associations of certain of our railroads.
4. Coley: Internat. Jour. of Surg., January, 1908.
5. See table at end of this article.
6. Unfallversicherungsgesetz, mit Anmerkungen von Dr. E. von Woedtke, 7te Auflage, Berlin, 1901.

A TABULATED REVIEW OF WORKMEN'S COMPENSATION LAWS IN EUROPE.*

Twenty-Three States	First Law.	Last Law.	Occupations Covered.	Distribution of Load.	Insurance.	Tribunals.
Germany	1884	1900	Manual labor only.	Borne by both parties.	Compulsory, mutual.	Arbitration courts.
Austria	1887	1902	Manual labor only.	Borne by both parties.	Compulsory, mutual.	Arbitration courts.
Norway	1894	1906	Manual labor only.	Employer alone.	Compulsory in State institutions.	1. Insurance office. 2. Special commission.
Finland	1895	....	Manual labor only.	Employer alone.	Compulsory in government or private institutions.	1. Insurance office. 2. Lower courts.
England	1897	1906	All employments and Salaried employees.	Employer alone, but administration at expense of State.	Voluntary or by approved mutual schemes.	1. Arbitration committees. 2. Arbitration from County courts. 3. Local magistrates.
Denmark	1898	1903	Manual labor only.	Employer alone.	Voluntary or in approved mutual insurance.	1. Insurance council. 2. Minister of Interior.
France	1898	1906	All employments and salaried employees.	Employer alone.	Voluntary.	1. Local justice of peace. 2. Higher legal tribunals.
Italy	1898	1904	Manual labor only.	Employer alone.	Compulsory in some institutions.	1. Local arbitration board. 2. Local magistrates.
Switzerland ...	1899	....	Regulation by Cantonal enactments only.			
Spain	1900	....	Manual labor only.	Employer alone.	Optional.	Permanent labor—arbitration tribunal.
Six English Col.	1900 to 1906	....	All employments and salaried employees.	Same as Great Britain.	Voluntary or by approved mutual.	1. Arbitration. 2. Local courts.
Holland	1901	1903	Manual labor only.	Employer alone.	Optional.	1. Royal Ins. Bureau. 2. Local Arbitration bd. 3. Central Arbitration bd.
Sweden	1901	1904	Manual labor only.	Employer alone after the 4th week.	Optional in State or private institutions.	1. Arbitration. 2. Ordinary courts.
Greece	1901	....	Mines, quaries and metallurgical only.	Employer, but also in small part by workman.	No provision.	1. Insurance council. 2. Ordinary courts.
Luxemburg ...	1902	....	Manual labor only.	Borne by both parties.	Compulsory in State institutions.	1. Ins. institution. 2. Justice of peace or arbitration. 3. Higher courts.
Belgium	1903	....	All employments.	Employer alone.	Compulsory, either by employer, or in Ins. Co.	Local justice of peace, with right of appeal.
Russia	1903	....	Manual labor only.	Employer alone.	Optional.	Ordinary courts, but no courts costs; fees of attorney fixed by court.
Hungary	1907	....	All employments and salaried employees.	Borne by both parties.	Compulsory in State institutions.	Arbitration courts.

Employer liable for injury to employe in all States; no exemption except for gross carelessness or illegal act of employés. Amount of compensation based on wage in all States except Sweden, and fixed by law in all States; includes in all States medical, surgical and funeral expenses. The benefits of these laws are usually extended to corresponding classes of State employés. Almost all of the laws are framed with a view towards escaping the expense of the intervention of lawyers or legal tribunals. The proceedings usually resemble an arbitration before a commission, or—as in our country—the informal courts held by Masters in Chancery. In case of insolvency, claims for allowances—pensions, etc.—have a prior lien.

* See Bulletin Bureau of Labor, U. S., Washington, January, 1908.

by Bismarck, brought before the Reichstag the most radical and complicated social-industry policy ever espoused by a European government.

But it must be noted, in order to understand the sources of the ultimate supreme excellence of the German system, that in the Imperial Code has been developed, *under the influence and in consequence of the university training to which most of its makers have been subjected,* a more consistent progression toward a solution of the modern industrial problem than is to be found in any other body of law.[7]

Admitting also the postulate that the modern study of social philosophy has made its deepest impression upon the German university student, it is no difficult matter to see these convictions, within succeeding decades, transmuted and matured into practical legislative results.

The story of the rise of the social-democratic party is inseparable from that of the modern movement toward a general reconstruction of German and European industrial relations. It cannot be forgotten that without this third party—always in the minority, always segregated from Conservatives, Liberals and Clericals, yet always with increasing numbers and influence to force its timely but unwelcome views upon the attention of the Reichstag—there would have been very little of that constructive industrial legislation, either in Germany or in other European countries, by which the lives of the laboring classes have come gradually to be worked out under an entirely different system of law from that which governed their fathers.

It has been the misfortune of the social-democratic movement that, outside of Germany—and especially in America, where ideas of social philosophy begin and end with the individual, and are not only primitive but reactionary—this party has been constantly associated with the party of nihilism and anarchy. Exactly the contrary is true. Marx, the founder of the International Labor party, and Lassalles, the first great labor leader in the Prussian assembly, were trained at Berlin—Marx by the side of Bismarck—and all three absorbed the peaceful and really conservative teachings of Hegel. Nothing was more abhorrent to Lassalles—or to Liebknecht, his successor—than the violent and sulky negations of Bakounine and his nihilist followers, and when the latter endeavored to gain control of the first International Labor Congress they were defeated by an overwhelming majority. Under the arbitrary powers of Bismarck and the Crown, aided by the large conservative and liberal majorities in the Reichstag, the social-democrats labored for twelve years under unjust disabilities, tending to class them to the outside world among those political outlaws who were in favor of carrying their purpose by violent or obstructive methods. But these men, whose well-matured minds were trained in just as orderly an adjustment of philosophical processes as were the minds of those who sat on the more favored

7. The German University offers to a remarkably large percentage of the most brilliant of its students an opportunity for easy entrance into a permanent and useful official life. The man of brains and persistent energy, who in our country leaves the University to find a ready financial success in business and the professions, and who turns only temporarily and semi-occasionally to politics, finds in European countries a more congenial and ultimately more satisfactory direction for his trained talents in a life devoted to constructing and operating the machinery of government.

benches, finally impressed their views—even while still under the ban of the law—upon their opponents, and forced from them legislation, the seed of which was sown by Friedrich Hegel more than fifty years before in the University of Berlin.[8]

We can hardly consider the German method of dealing with industrial accidents without stopping to recognize the source of this racial movement—state socialism, if you will—toward publicly controlled provision for old age, sickness, education, ownership of railroads and telegraph, and the municipal acquisition of land, of which the Accident Insurance Law is only a fragment. But the scope of these studies can hardly allow a consideration of more than one phase of this general progression toward industrial betterment.

VI.

Formal recognition of the necessity for legislation in the interest of injured workmen began with the short clause in the Prussian Railroad Law of Nov. 3, 1838, to which reference has been made in the previous paper. Certain paragraphs of the old Prussian Commercial Code also show a conviction already crystallizing, that the unfortunate plight of those employees who were the victims of trade accidents, could hardly be relieved through the application of any existing doctrine of civil or common-law responsibility which might reach only the negligence of an employer. But these fragmentary efforts at succor were hardly more

8. Some of the combinations of German university and political life made strange bedfellows.

Carl Marx, a Jew, and Bismarck, were both born in 1815, and studied together in Berlin, where Hegel had taught from 1818 to 1831. The former, however, instigated and the latter aided in repressing the revolution of 1848. Lassalles, also a Jew and also a graduate of Berlin, and a follower of Hegel and Marx, founded the Social-Democrats in 1861. Bismarck, for more than a generation, found a combination with that party, from time to time, less humiliating and costing less sacrifice of imperial prestige, than would have been an out-and-out defeat at the hands of the Liberals. Indeed, he was often accused—with much show of reason, in view of his early associations and later industrial policy, and of his avowed friendship for Lassalles—of being himself a concealed Social-democrat. Yet in spite of the fact that Bismarck owed more to Lassalles than to any other one man among his early contemporaries, he did little to mitigate and much to increase the political disabilities of his secret friends, if such they were, for it was not until 1890, that the law of 1878—of which he was the sponsor—against the Social-Democrats was relaxed. Bismarck was an opportunist—so far as political measures were concerned—and his candid opinion of economic doctrine may be summed up in his cynical epigram on the Sickness Insurance Bill: "Call it Socialism, or what you will, it's all one to me—mir ist's einerlei—so that is passes."

Lasalles died in a duel at Geneva in 1864, but he lived long enough to thoroughly organize the Social-Democrats, and to instill into the party the conviction that its usefulness depended on a peaceful unity of purpose, which, whilst maintaining political solidarity, should hold itself ready for temporary consolidation with any other party willing to help along the cause of the workman. He taught them—as he taught Bismarck in European politics—the great principle that more than temporary combinations were apt to mean absorption and annihilation.

The old kaiser was more frank and genuine than Bismarck in his confession of faith, as has been seen in the quoted extracts from his speeches, and, although of necessity monarchical, he was a Democrat in his tastes and a Socialist in his leanings. To make his situation more anomalous and embarrassing for Bismarck, and later on for his grandson, the future Kaiser, he fell under the influence of the court preacher, Parson Stoecker, who presently evolved—with imperial assistance—a party which they called Christian-Socialists, absolutely monarchical as to ideas of government, but distinctly Socialist as to industrial policy. This policy, somewhat modified, was adopted by the present Kaiser in the first years of his reign, and it was his advocacy of an International Industrial Conference which led, in part, to the rupture with Bismarck in 1890.

Thus, during the thirty years following his exile from Prussia, did Marx so succeed in saturating the social and political fabric of Germany with his economic views that, by 1880, party policies on this question—from Conservatives to Social-Democrats—differed merely as to the scope of the reforms and the methods by which they should be brought about.

than hints toward an ultimate direction which the law might take. During the ensuing thirty-three years the attention of German statesmen was so occupied with the rapidly changing aspects of European politics, that little apparent progress was made toward any readjustment of the industrial laws to the important changes which the introduction of steam-driven machinery was making in the status of the workman. We say that progress was apparently slight, but under the surface—and probably taking advantage of the diplomatic unrest which was diverting attention from internal affairs—was developing that social-democratic movement which was presently to result in legislation which twenty years before would have been considered revolutionary.

With the formation of the Germanic empire in 1870-1871, the situation changed; and Germany relieved of the duty of watching the eastern and western frontiers, turned energetically to the task of restoring and welding the laws and customs of the new federation into consistent and organic unity.

During the construction of the Imperial Code, by which the empire has been governed since 1871, and which is made up of laws passed by the Reichstag, after approval and sanction by the federated states, there was enacted, Jan. 7, 1871, an Employer's Liability Law, which definitely formulated the liability of railroads, mines, quarries and factories toward injured employees. On account of the necessary caution entailed by the legislative novelty of this enactment,[9] the framers of that law deliberately chose not to go, at that time, beyond certain narrow and experimental limits, but the intimation was clearly conveyed that the venture, if effective, was but a foretaste of future action. The two essential features of this law were curiously at variance, and led to situations quite as complicated as any which were observed to follow in consequence of the early English laws, or such as exist at the present time in the United States.

1. A railroad was liable for the consequences of an accident, unless it could show the cause to lie in the intervention of a higher power *or negligence of the employé—the burden of proving exemption was on the employer.*

2. A factory, mine or quarry was liable *if the employé could prove negligence—the burden of proof was on the employé.*

For workers in Group 2 the benefits were soon found to be illusory. In many instances the prescribed procedure was found to be a positive hindrance, especially to the survivors of fatally injured employés, for the heavy burden of proof had to be borne by those least able to bear it. Nor was the provision made to cover accidents caused by a fellow-servant, and the responsibility was limited to that arising under the civl law. Insolvency also furnished a ready method of escaping a heavy adverse judgment. Finally, it became a universal practice for employers to protect themselves through insurance companies, who not only paid no large damages without suit, but ground the workmen down to unjust settlements, and seriously impaired the friendly relations which should have been maintained between employer and workman. Thus, the workman,

9 See President Roosevelt's message, already quoted.

dissatisfied over a situation which, at a time when he or his family needed help most, gave them the worst end of every bargain, was preparing to lend a willing ear to the so-called socialist teachings of the social-democracy.

It was at this time that the official mind became so concerned over the progress of socialism that the law of Oct. 21, 1878, against the social-democrats was enacted. The serious character of this movement was recognized in high quarters, as well as the necessity for some step, not merely repressive and destructive, which would definitely satisfy the great body of still loyal workmen, that their hope of relief was to be realized by methods more peaceful and constructive than any which it was feared might germinate in the disabled, but still fertile, brains of the social-democrats.

To accomplish this purpose, any further extension of the doctrines of civil-law liability of employers was finally conceded to be out of the question, and it became necessary to rest relief measures upon that higher and more imperative doctrine of public policy, which imposes upon the state the duty of providing, somehow, for those injured while contributing toward the common wealth of the nation.

It is no easy matter to pick the historical thread of this particular legislation from that great fabric of laws woven during the period of 1880-1890, the makers of which sought no less an object than the cure of poverty and dishonorable alms-taking, through enforced prevention of the traditional improvidence of the workman. The task is made easier, however, because legislation necessary to attain this end touches such a diversity of interests that no general law would apply to all forms of disability. Thus, the duty of maintaining the sick, the infirm and the aged could neither be assumed by the state or the employer, nor borne by the family, without loss of self respect to the individual. Hence arose the system of compulsory sickness and old age insurance—a tax upon the wage of the individual by which the latter, during his period of activity, protects himself by contributing to a fund which maintains him during his period of disability. We need not here discuss the tendency or ultimate effects of this class of legislation, or defend it against the charge of paternalism, except to maintain that, during the twenty-five years since the law of June 15, 1883, went into effect, there has been no complaint either that it failed of its purpose, or that it has caused any honest workman to lean too heavily upon the paternal arm of the government.

The enactment of laws applying the principle of compulsory insurance to disability through sickness, etc., was comparatively easy, since no large financial interests were disturbed, no pre-existing system of law was upset, and the fund, being made up of millions of only small contributions, produced no effect upon individuals other than a pleasing sensation of independence and security.

The final passage of the Sickness Insurance Law, June 15, 1883, after several years' discussion, prepared the way for, and in fact was coincident with, a consideration of the much-needed changes in the system of dealing with those disabled through industrial accidents.

Here the conditions were widely different, since many important interests were involved—insurance, political, financial, legal, corporate, personal—all of which were able to bring great pressure to bear upon the Reichstag. These interests had to be either reconciled or ignored. It was at this juncture that the Kaiser, in the series of speeches from which extracts have already been made, laid down clearly the reason for such radical legislation, and indicated in no uncertain language the progressive lines along which it should proceed. These lines were as follows:

1. State control of the insurance system, to the exclusion of private or mutual insurance concerns, which had hitherto come between employers and workmen to the detriment of both.

2. A distribution of insurance charges, so that neither employer nor employee should pay more than his fair average allotment.

3. The formation of groups or associations of employers, within trades whose accident risks reached about the same average, and whose assessments could be equitably estimated from the same statistics.

4. The recognition of the principle that the injured workman—irrespective of any source of negligence except the grossest—is entitled to demand compensation, at the expense of the industry, for injuries sustained during the process of production.

5. The removal of this class of cases from the jurisdiction of the ordinary courts, and the establishment of special tribunals and procedures for their adjustment.

As might have been expected, several unsuccessful attempts were made to elaborate the details of a law which should successfully operate along the lines indicated, without either producing friction between the states, ruin to certain manufacturing interests, or injustice to many individual workmen.

It first became necessary to collect statistics of accidents arising in the various industries, and occurring during a period which should be long enough to give practical value to the data. This period was fixed at the four months August-November, 1881, and it is of the gravest interest to the American student of these problems to note that employers of labor throughout Germany cooperated enthusiastically with the Department of the Interior in collecting the information. By the end of 1881 classified statistics from industries employing over 2,000,000 workmen were available. Thus was secured a practical basis upon which to elaborate the details of the subsequent legislation. The hardships which the delay caused to those who were most interested in a termination of the situation were very materially mitigated by provision in the law of June 15, 1883—which went into effect Dec. 1, 1884—for the care of *injured* workmen up to a limit of thirteen weeks' disability. This provision stipulated an obligatory assessment against employers, of an amount equal to one-third of the entire Sickness Insurance Fund, and was designed to meet the immediate expenses of disability through traumatism. All questions of liability, as well as of damages for death, and of disability and expense beyond thirteen weeks, were left to be settled by the ordinary courts.

Between the years 1881-84 three various attempts were made to construct a law which should not only bring adequate relief to those unprovided for by the Sickness Insurance Fund, but which should lift the entire question of damages out of the civil courts into the higher plane of public policy suggested by the Emperor.

It was finally decided, after a study of the collected trade accident statistics—especially of those throwing light on the coefficient of risk for the various callings—to try the experiment of a limited law which would apply only to workers in manufacturing industries, and to follow that law, if its operation was successful, with others which would finally reach every class of workmen. To one man more than all others is due, not only the framework of the original law, and its enactment by the Reichstag, but also the immediate and permanent success which marked its subsequent operation—T. Bödiker, at that time Imperial Councillor in the Department of the Interior, and later the head of the Imperial Insurance Bureau. The law was passed by an overwhelming majority, July 6, 1884. With the enthusiastic cooperation of the manufacturing interests, Bödiker then undertook the organization of the complicated details necessary to carry its provisions into effect, and on Oct. 1, 1885, by an imperial order, the long-looked-for Industrial Accident Insurance became an accomplished fact.

The passage of this law was followed rapidly by others, widening the scope of the original law to the employés of Land Transportation Companies and certain branches of commerce—Oct. 1, 1885-June 24, 1886; Farm and Forest, May 5, 1886; Building Trades, July 11, 1887; Marine-Service, July 13, 1887; civil employés of the state, March 15, 1889.

During the years following these enactments, the Imperial Insurance Bureau, gaining confidence with the knowledge and experience acquired through the continued operation of the system, was enabled to prepare a general code—revising, consolidating and improving these various laws. This code was adopted by the Reichstag and went into effect in the law of June 30, 1900, and is now operative throughout the German empire.

VII.

The workmen's insurance system of the German empire is organized as a bureau of the Department of the Interior. Each state of the federation has also its own bureau of insurance controlling industries within the state. The method of operation of the state bureaus is identical with that of the Imperial Bureau.

The Imperial Industrial Insurance Bureau is composed of a president, with two directors, and a number of other officials appointed for life by the Emperor, four directors selected periodically from the Bundesrath, and two directors selected by the Bundesrath to represent the workmen. This bureau has charge of the details of the system—collects statistics, makes rules and reports, and serves as a court of final appeal.

Operating under authority of the bureau are the "Courts for Industrial Insurance Claims," composed of one government official, and two representatives each, from the employers and the workmen. These

courts have jurisdiction over all cases not settled by the trade committees, but in certain cases their decision is not final, and appeal may be taken to the bureau.

The investigation of accidents is made by the police and reported to the bureau, and it is also the duty of employers to report all accidents promptly—failure to do so entails a heavy fine.

There is no trial by jury, and the court takes testimony as an investigating body or commission, usually without the intervention of attorneys representing either interests. The courts are authorized to appoint medical examiners and experts, and examination cannot be refused.

Awards, pensions, allowances and expenses are paid promptly by the Post-Office Savings Bank, on vouchers issued by the courts or by the trustees of the trade groups. The bank is reimbursed once a year by the trade organizations, without payment of interest charges, in the manner indicated in a subsequent paragraph.

The various industries are organized into *groups of trade units*, based on a careful study of their coefficients of risk, and the common interests of each group are in the hands of trustees, who collect fines and assessments, disburse money, make reports, recommend rules, and serve as the medium of intercourse, not only between the trade groups and the Bureau of Insurance, but also between the employers and the trade unions. The groups, although possessed of a certain limited internal autonomy, are under the direct supervision of the bureau. Operating under and reporting to the trade groups are committees, whose duty it is to adjust questions of minor injury, and who cooperate with the surgeon and with representative committees from the workmen, in the determination of extent of injury and proper period of disability.

Should no agreement be reached between the injured workman and the trade committee, the case is carried before a Court for Industrial Claims, having full authority to call lay and expert witnesses, and to assess damages. Inasmuch, however, as questions of negligence never arise, except where its extreme or criminal character sends the case before another tribunal, the duty of the Insurance Courts consists largely in a determination of the injury and the extent of disability arising therefrom.

Ex.-gr. The Insurance Bureau has ruled that a person developing a "traumatic" hernia (whatever that is), in consequence of his occupation, receives a pension equal to 10 to 15 per cent. of his normal wage (300 times the average daily wage) during his disablement, whether he wears a truss or not. The following interesting question is the basis of a difference of opinion between the Bureau and the Insurance Courts: Whether refusal to accept operation should lead to a suspension of the pension? The Bureau holds that it should not.

The amount of assessment—which includes both the annual liquidation and a contribution to the reserve fund—paid by the trade groups and by the industrial units comprising each group, is determined by the bureau, after a periodical study of the statistics and of the annual liquidation with the Post-Office Savings Bank. The groups are allowed to graduate assessments against members according to the statistical records of each member, and *danger classes* are authorized, in which are included especially dangerous trades, as well as those industrial units whose acci-

dent statistics are high. A transfer of a trade unit can be made from a higher to a lower class, if it can be shown that his statistical record for a given period warrants such transfer.

In order to stimulate still farther the effort to reduce the number of accidents, committees representing both employers and workmen are designated to cooperate with the bureau in the preparation of rules and penalties for the prevention of accidents. These rules have full legal force. Fines go into the fund for insurance against sickness.

Should a trade group be called on to pay indemnity for an injury sustained through the carelessness, negligence or intent of one of its units, which has been proved in the Criminal Court, or which the group through its authorized representatives has been able to demonstrate, redress is allowed the organization against the trade unit, by which the former is reimbursed for any money paid out to meet the unusual loss. This redress applies, however, only to proved criminal negligence or intent of the employer himself, and not to that of his representatives. Since such damages may have to be liquidated by the payment of a lump sum, trade groups are allowed to take out private insurance against these unusual losses.

For all those workmen earning 2,000 marks and under by manual labor, insurance in a Sickness Insurance Fund is also compulsory and guarantees protection aginst sickness, old age, invalidism and against the first thirteen weeks of disability resulting from injuries. To this fund the workmen contribute two-thirds and the employer one-third. During four weeks of his disability the workman receives from this fund 50 per cent. of his average wage for total disability, and a proportionate amount for partial disability. If disabled for more than four weeks, to this amount paid from the sick fund is added 16⅔ per cent., paid by the trade group (employer) up to the end of the thirteenth week. During this period the expense of medical and surgical care is paid out of the sickness fund.

It will be noticed that the workman's own share toward his maintenance during recovery from injuries is represented in his contribution of two-thirds to the sick fund. Recollect, however, that this payment is made also for other and entirely personal conditions of disablement, while a large proportion of the contribution of one-third which the employer makes must go toward caring for disabilities which he has had no share in causing. If no sickness insurance system is in force covering certain employés of certain industries, the entire care of the injured workman falls on the employer or his group. Against such contingencies the employer or the group is entitled to take out private insurance, but in the adjustment of the indemnity the insurance company has no right to interfere with the usual stipulations and operation of the law.

Insurance against accidental injury is compulsory for all those earning 3,000 marks, or under, by manual labor. Assessments to meet the requirements of this fund—reserve, administration, pensions, death losses, surgical and funeral expenses, weekly indemnities beyond the fourth and thirteenth weeks of disability—are levied altogether against the employers, and are payable at the end of each year by the units to the

trade group, and by the latter into the Postal Savings Bank on receipt of a yearly statement of moneys disbursed. The government through the Post-Office Bank, thus becomes the guarantor of the scheme. Disbursements are made by the bank, in advance of the yearly assessments, upon presentation of suitable vouchers from the trade association, from the courts, or from the Bureau of Industrial Insurance. The bank charges no interest, and no money, beyond the reserve fund, is tied up in advance to meet the payments.

For all injuries received during employment—regardless of ordinary negligence or of any former liability under the common law—the workman receives compensation, unless the disability is not more than four days, or unless it arises in consequences of gross negligence or an illegal act—in such latter cases the compensation may be either refused or reduced.

After the thirteenth week, the employer—or the trade group—meets the entire disability expense. For total disability the employee receives 60 per cent. of his average wage if under 1,500 marks; if over 1,500 marks, he receives compensation based on 60 per cent. of 1,500 marks, plus one-third of the excess.[10] If the injured employee is helpless he may receive up to 100 per cent. of his average wage, especially if he was entirely innocent of the cause of his disability. For partial disability, an estimated payment is made, based on the amount of disability, and the latter is not held to be represented strictly by loss in earning capacity (e. g., hernia, piles, one finger, etc.)

If he wishes, the injured party may elect to be maintained at a hospital or home for disabled. Pensions up to 15 per cent. of the average earnings may be paid off *en bloc* through the Post-Office Savings Bank, by estimating the value of a principal producing the given pension.

Funeral expenses are paid by the trade group (employer), and are graduated from a minimum of 50 marks up to one-fifth of the average annual earnings of the dead workman.

Death pensions are payable to dependent heirs up to 60 per cent. of the annual wage, if the latter is less than 1,500 marks. If over 1,500 marks, only one-third of the excess is taken in making the computation.[10] The wife's pension is 20 per cent. or more, and the balance may go to children, needy dependents and grandchildren.

Only under certain conditions, and in especial cases where permission is given by statute, may private insurance be taken out. In the small industries, not joined to the trade groups, such insurance is permitted, and groups may insure themselves against certain claims arising through extra hazard or through prosecution of their units for criminal negligence, etc. But no insurance company or its agent is allowed to take part in the settlement, or in any way to come between the parties to the dispute.

Should changes arise in the condition of a workman receiving a pension, which are attributable to the injury upon which the pension was originally based, the amount of the pension may, after five years, by an order of court, and after suitable investigation, be increased or diminished.

---

10. Sixty per cent. of $(1500 + \frac{35}{\times})$

Suits conducted under the ordinary processes of civil law are barred from the Courts for Industrial Claims, except only where such arise through disputes over the division of awards, family rights, etc.

Distribution of the assessment load, and representation of Employers and Workmen in the personnel of the Bureau and Courts:

The insured workmen have their own trade organizations (trade unions), and are not represented in the incorporated trade groups of employers.

In the preparation of regulations, etc., designed to secure better protection against accidents, workmen's committees meet committees from the employers and the representatives of the Insurance Bureau.

The workmen carry none of the load arising through pensions, death claims, administration, or for disability allowances and surgical attention after the thirteenth week. To the expense of his care for the first thirteen weeks, the workman contributes such a proportion of the two-thirds which he furnishes to the Sickness Insurance Fund, as would be represented by the ratio which the expenditure for traumatic disability bears to the amount taken from the fund for the relief of sickness. This proportion when worked out is an extremely small one, and the relative charge against the workman appears still less, when we discover from a study of the statistics that the bill for the care of injured workmen during thirteen weeks or under, is only 8 per cent. of the total accident insurance load. It should be remembered, also, that not only does the employer contribute to this 8 per cent., but he also contributes one-third to the entire sickness charge. Thus, the actual contribution of the workman toward his maintenance during disability through accident is extremely small, and is more than offset by the employer's contribution to the fund for sickness.

On account, however, of this contribution, the workman receives a limited representation in, and takes part in the deliberations of the Insurance Bureau, to the extent of two members periodically designated by the Bundesrath. Very different, on the other hand, is his status in the Claims Court; for here he receives equal representation with the employer, since his claims, or his rights, are not based on any money paid into a fund—which exists merely for the purpose of liquidating such claims—but on the cash annuity value of the earning capacity which he has been deprived of through the accident, and which under the law must be liquidated irrespective of responsibility.

VIII.

The writer has endeavored in the foregoing sections to furnish, in brief, such a résumé of the German Industrial Accident Insurance Law as will render its requirements and operation intelligible to the student who has not the time to study its details more thoroughly. The law cannot be recommended to those who are in search of light summer reading. As compared with the five and three pages of our own Federal Employers' Liability Acts of 1906 and 1907, or with the English Workmen's Compensation Act of 1906, of 22 pages, including all schedules and other details; or with the French Law of 34 articles, it is a truly

monumental document of 165 sections and numerous subsections, to which are added a Building and Accident Insurance Law of 48 sections, and various imperial orders, schedules, ordinances, report forms, etc., prescribing down to the minutest details the machinery by which the law is to be carried into effect.[11]

The intricacy of the German law is apt to produce, at first sight, an unfavorable impression upon the American mind—accustomed as it is to short laws merely setting forth general principles, designed to be left for application and details largely to the interpretation and individual judgment of courts or commissions. Yet the American critic is forced to suspend judgment, when he realizes that through these laws the young German empire has become a pioneer for all other nations except China, Turkey, Persia—and the United States. Since 1884, 22 other governments have followed the lead of Germany in enactments providing for some form of industrial insurance. In Germany the system has passed through twenty-five years of probation, and none of its ramifications show at the present time any sign of breakdown. Although there has been much malingering, both of sickness and of injury, these forms of social pathology have served simply to sharpen the wits of courts and medical experts. In Germany and France an entirely new branch of medicolegal literature has sprung up, devoted to the consideration of industrial accidents and diseases, and the methods by which they are simulated.[12]

A true test of the success or failure of the operation of any law depends on the degree of contentment of those reached by its heaviest restrictions and requirements. Applying this test, the general opinion held by German manufacturers is that compulsory accident insurance, despite the burden and expense, tends to the improvement of industry, not only through the relief which it offers in the prompt settlement and lessened expense of claims for damage on account of trade injuries, but also on account of the better and more friendly relations brought about between employers and workmen through removal of an old and troublesome bone of contention. Under this law, and probably largely in consequence of it, Germany has risen during the last twenty years from the rank of ninth to that of third among exporting countries.

From the American standpoint, a closer scrutiny of these fundamentally different methods of stating legal truth leads to two lines of comment, both favorable to the German system. First, in an industrial community as complicated as that existing in the German Empire, and such as ours is rapidly becoming, Justice is best administered along pre-arranged lines, laid down by those who are technically familiar with industrial intricacies and weak points. For a governing body to guaran-

---

11. So far as the writer is aware, the law has never been completely translated into English. Owing to the technical and idiomatic character of the text the translation is a very difficult one, and such as would strain the vocabulary of the most accomplished linguist. The Law, with an Introduction and brief comments in small type by Woedtke, Director in the Imperial Department of the Interior, is contained in an octavo volume of 569 pages, Berlin, 1901, 7th edition.

12. Golobiewski, Diseases Caused by Accident. Berger, Les Hernies et les Accidents du Travail. Sultan, On Hernia (Trans. by W. B. Coley). Les Accidents du Travail, G. Ollive, Paris, 1904. Rene Sand, La Simulation et L'Interpretation des Accidents du Travail, Bruxelles, 1907. Handbuch der Unfall Medizin mit Berucksichtigung der Unfallversicherung, Stuttgart, 1907. Paul Chavigny, Diagnostic des Maladies Simulies dans les Accidents du Travail, Paris, 1906.

tee that Justice shall reach its right destination every time, in such a labyrinth, requires that the details and branchings of the path shall be placed beyond the possibility of judicial error in finding the way. To be sure, individual talent—either upon the bench, or brought to bear upon the judiciary—has less opportunity, under this system, of winning distinction, through brilliant and far-reaching interpretation and application of legal principles. But, on the other hand, the individual before the bar is comforted with the certainty that Justice, in his particular case, is not to be sidetracked through some twist which the judicial mind may choose, or be persuaded to give to a loosely constructed law.[13]

In this respect the German law is like all other native German products—complete as a whole, with details worked down to ultimate dividing points.

One instance out of many will suffice to illustrate this useful elaboration of details. Provision is made by which a trade group of employers can recover from one of its units, which has been proved to have violated certain safety ordinances or certain provisions of the criminal law, such moneys as the group has been obliged to pay, under the law, to the employé injured through such violation. Thus, the injured and needy employé receives his "rental" automatically and immediately through the Postal Savings Bank, the trade group is sure of reimbursement within a reasonable time, and the negligent employer is penalized, not only by the fine imposed on him by the court and by having to reimburse the association in addition to his usual assessment, but also by finding himself, through his negligence, in bad odor among his business associates and competitors. This enforced interpretation of the doctrine of negligence would hardly appeal to those American corporations which practice the "philosophy of individualism" for what there is in it.

A second line of comment is suggested, when we consider the evils which have arisen in England and in our own country, through this failure of the laws to specialize *pari passu* with the specialization of the commonwealth and its industries. Nearly all of our own American industrial troubles, arising not only through accidents, but also at every other point of contact between employers and workmen, have occurred through lack of specific legislative formulas by which such occurrences could be adjusted along pre-ordained lines. Our courts have for a long time lacked suitable statutory material out of which to construct their decisions, and in this way have been led to read strained and unnatural meanings into the simple laws which sufficed to hold together the primitive society of our "hand-made forefathers." Enough has been said by others relative to the fact that, in spite of an overweening respect for beaten paths, the legal mind, when placed upon the bench, is still no more than human in its tendency to err and err again when wandering into new fields. The traditional judicial obstinacy in persistently thrusting industrial feet into outgrown common-law shoes has also been sufficiently dwelt

13. Not to multiply illustrations to convince the reader that this criticism is not a fanciful one, it is only necessary to remind him that Chief Justice Marshall—swayed by the ponderous eloquence of Daniel Webster—delivered in the Dartmouth College Case the most far-fetched and far-reaching decision that has ever brought oppression to a corporation-ridden American public.

upon not to require further amplification. But it must be said that, after all, the duty of the courts, even in this country of wide-reaching application of common-law principles, goes no farther than to interpret such laws as actually exist, and does not in any way concern itself with suggesting or enacting new legal formulas.

So that whether we scrutinize the elaborate constructiveness of the German laws, which leave nothing for the bench to sharpen its wits upon, or the studied simplicity of our own moss-grown edifice, which is so far out of plumb that it has come to lean too heavily upon the judicial imagination, and fails utterly to furnish any true shelter for many recent and important problems, we are impressed with the vast superiority of the German method of dealing with these difficulties over such primitive methods as are at present available in the United States. The only question which arises is, how much of this method would thrive, if grafted into such a widely variant species of commonwealth as our own? To this question we will recur in discussing the direction to be taken in planning for the future betterment of our own system.

ILLINOIS STATE MEDICAL SOCIETY; QUARTERLY SESSION OF THE COUNCIL

The council in quarterly session convened at the Great Northern Hotel, Chicago, on October 14, at 10:30 a. m. There were present Chairman Black, Newcomb, Percy, Roans, Stealey, Mitchell, Harris and Pettit, President Wiggins and Secretary Weis, by invitation, S. C. Glidden, Benjamin Gleeson of the Committee of Arrangements, and Editor Kreider.

Chairman S. C. Glidden was asked to make a report of the work so far done by his committee. He also presented the names of the committee in full as follows: Stephen C. Glidden, chairman; E. B. Cooley, H. S. Babcock, Benjamin Gleeson, C. E. Wilkinson, A. M. Miller, R. A. Cloyd and Frank Barton. Upon motion, the election of this committee of arrangements by the Vermilion County Medical Society stands approved.

President Wiggins reported upon the question of change of date of the coming meeting. He stated that owing to the fact that the meeting of the A. M. A. is the same as in former years, he thought it unadvisable to change the date of our annual meeting.

Secretary Weis reported as follows, as a committee on a working plan of a Lecture Bureau:

Your committee on formulating a scheme for the establishment of a Lecture Bureau begs leave to say that the following-named physicians (see list below) in Chicago, St. Louis and the various cities throughout the state have consented to the terms suggested, i. e., that each one stands ready to respond to a call to present a paper or a lecture to any of the county and district society meetings without expense to the local society. This list will be added to by volunteers and others.

In outlining the method, I beg that you will understand that this is just tentative, and may and perhaps must be changed by different conditions arising from time to time.

In the first place, I shall send a circular letter to every secretary, giving the names of those who will respond to call, suggesting, however, that a selection should be made of the physician nearest to him.

Second. Give him the choice of three or four names, should it be that the first choice would find it impossible to come.

Third. Every secretary in making application shall state the place, the time and probable attendance.

Fourth. At least three weeks' notice must be given.

Fifth. There shall be a standing notice published in THE JOURNAL in relation to the Lecture Bureau.

Sixth. There shall be an implied pledge on the part of the secretary of the local society to forward the minutes of each meeting to the editor for publication.

E. W. WEIS, Committee.

SURGERY.

John B. Murphy, Chicago.
E. J. Senn, Chicago.
M. L. Harris, Chicago.
Cassius D. Rogers, Chicago.
A. E. Halstead, Chicago.
F. A. Beasley, Chicago.
William Hessert, Chicago.
J. L. Wiggins, East St. Louis.
George W. Cole, St. Louis.
William Bartlett, St. Louis.
Francis Reder, St. Louis.
Carl E. Black, Jacksonville.
E. Mammen, Bloomington.
J. W. Hamilton, Mt. Vernon.
J. H. Stealy, Freeport.
C. U. Collins, Peoria.
J. F. Percy, Galesburg.
Geo. N. Kreider, Springfield.
R. J. Christie, Quincy.
S. C. Stremmel, Macomb.
H. C. Mitchell, Carbondale.

OBSTETRICS.

Joseph B. DeLee, Chicago.
Carey Culbertson, Chicago.
Hugo Ehrenfest, St. Louis.

GENITOURINARY.

L. E. Schmidt, Chicago.
C. E. Buford, St. Louis.

MEDICINE.

Frederick Tice, Chicago.
Arthur R. Edwards, Chicago.
Alfred C. Crofton, Chicago.
J. T. McAnally, Carbondale, Ill.
Frank Billings, Chicago.
J. F. Percy, Galesburg, Ill.
J. W. Hamilton, Mt. Vernon, Ill.
George A. Zeller, Peoria.
J. W. Pettit, Ottawa.
Hugo Summa, St. Louis.
J. S. Myer, St. Louis.
Albert E. Taussig, St. Louis.

EAR, NOSE AND THROAT.

Albert H. Andrews, Chicago.
F. Gurney Stubbs, Chicago.
John R. Fletcher, Chicago.
C. M. Robertson, Chicago.
W. E. Sauer, St. Louis.
M. A. Goldstein, St. Louis.

EYE.

Willis O. Nance, Chicago.
W. Allen Barr, Chicago.
Thomas Faith, Chicago.
Meyer Weiner, St. Louis.
John Green, Jr., St. Louis.

SKIN.

Oliver S. Ormsby, Chicago.
R. R. Campbell, Chicago.
W. A. Pusey, Chicago.

NEUROLOGY.

Hugh T. Patrick, Chicago.
L. Harrison Mettler, Chicago.
Geo. A. Zeller, Peoria.
Frank P. Norbury, Kankakee.
V. H. Podstata, Elgin.
W. W. Graves, St. Louis.

RECTUM.

J. Rawson Pennington, Chicago.

PEDIATRICS.

Alfred C. Cotton, Chicago.
J. Warren Van Derslice, Chicago.

ORTHOPEDICS.

Alex. C. Wiener, Chicago.
John L. Porter, Chicago.
John Ridlon, Chicago.

PATHOLOGY.

R. L. Thompson, St. Louis.

STOMACH.

H. W. Soper, St. Louis.

ORGANIZATION.

H. C. Mitchell, Carbondale, Ill.
J. W. Pettit, Ottawa.
E. W. Weis, Ottawa.

It is moved by Harris and seconded that the plan outlined as above be adopted.

Chairman Black made a report that he had moved in the matter of supplying directories to each member of the State Society. It is moved by Pettit and seconded by Stealy that the action of Black be approved. Carried.

Committee on Vouchers, Harris, Black and Brown, presented a system of double voucher and check, such as is now used by the A. M. A. It is moved and carried that this plan be adopted by the Illinois State Medical Society.

After considerable discussion on the subject of whether the Medicolegal Committee should pay whatever judgments may be entered up against members, it is moved and carried that the secretary be instructed to request the executive committee of the Medicolegal Committee to present at the next meeting of the Council its views and necessary data on the advisability of enlarging the *per capita* tax to cover judgments.

Adjourned.

NOTICE.

LECTURE BUREAU ILLINOIS STATE MEDICAL SOCIETY.

Secretaries and program committees desiring lecturers should communicate directly with the Secretary of the State Medical Society and not with the individual lecturer. They should send in the request in ample time, *at least* three weeks prior to the meeting. Give date, place and probable attendance. Several names should be selected.

Address all communications to Dr. E. W. Weis, Secretary, Ottawa, Ill.

ILLINOIS MEDICAL JOURNAL

THE OFFICIAL ORGAN OF THE ILLINOIS STATE MEDICAL SOCIETY.

GENERAL OFFICERS 1909-10

PRESIDENT - - JONATHAN L. WIGGINS, EAST ST. LOUIS
FIRST VICE-PRESIDENT - CLIFFORD U. COLLINS, PEORIA
SECOND VICE-PRESIDENT - - JAMES E. STUBBS, CHICAGO
SECRETARY - - - - - EDMUND W. WEIS, OTTAWA
TREASURER - - - EVERETT J. BROWN, DECATUR
(Ex-officio Clerk of the Council.)
EDITOR - - - - - GEORGE N. KREIDER, SPRINGFIELD
522 Capitol Avenue.
ASSISTANT EDITOR - GEORGE EDWIN BAXTER, CHICAGO
4603 Evanston Avenue.

THE COUNCIL

CARL E. BLACK, JACKSONVILLE. — J. WHITEFIELD SMITH, BLOOMINGTON.
H. C. MITCHELL, CARBONDALE. — J. Q. ROANE, CARLYLE.
M. L. HARRIS, CHICAGO. — J. W. PETTIT, OTTAWA.
J. F. PERCY, GALESBURG. — J. H. STEALY, FREEPORT.
W. K. NEWCOMB, CHAMPAIGN.

NOVEMBER, 1909.

OUR LONDON CORRESPONDENCE.

In another column will be found an interesting communication from London, England, contributed by Dr. Nelson M. Percy, Jr., surgeon to Augustana Hospital, Chicago, who is devoting some time to surgery in the English metropolis. This letter will be found extremely interesting as giving an accurate account of the work being done in the best hospitals there. Especially interesting will be found Dr. Percy's account of the clinic of Arbuthnot Lane, whom he found treating all cases of simple fractures by operative means and the use of a steel plate, which is fastened to the bone by steel screws. It appears from this that we have reached a point where all fractures can best be treated by operation, and it will not be surprising that a few years would radically change our views on the method of treating broken bones. Certainly the results obtained by Dr. Lane should call the attention of all surgeons to the benefits of immediate operation. Splints are rarely used at this clinic. Dr. Percy has seemingly obtained unusual opportunities for meeting the best class of foreign surgeons, and THE JOURNAL is to be congratulated on having the privilege to print his communications. We are indebted to Dr. E. A. Ochsner for this opportunity. Other letters will follow from time to time.

LEGISLATION CONCERNING OPTICIANS.

At the May meeting of the Chicago Ophthalmological Society, Dr. Frank Allport in the chair, there was an interesting discussion of the present status of legislation concerning opticians, and Dr. E. V. L. Brown recommended that it might be well to secure a compromise between the society and opticians so that a law placing the opticians under the authority of the State Board of Health might be agreed upon. It was with great difficulty that the bills licensing opticians independent of the profession were defeated in 1905, 1907 and 1909, and it is altogether probable that an effort will be made again before the next regular session which will be successful. There is no doubt that the fitting of glasses is a branch of the practice of medicine and that it would be much better if the opticians were regularly educated and licensed as physicians, but so far has this practice of optometry proceeded that it would be almost impossible to put these persons out of business, and if they cannot be put out of business for the common good they should be limited in their practice, and, moreover, a large number of ignorant traveling spectacle venders should be prevented from swindling the people. We hope, therefore, that some arrangement may be entered into between the ophthalmologists and the opticians before the next regular session of the legislature which will be mutually satisfactory to the different organizations and at the same time conserve the rights of the people.

BEWARE OF SWINDLER.

Dr. H. C. Mitchell, of Carbondale, writes us that he is again put to the annoyance of having a swindler call upon his professional friends in various parts of the state purporting to be a son of his and asking for money on his, Dr. Mitchell's, account. A number of professional gentlemen have already been held up for loans of various amounts, and the Doctor is anxious that all physicians in the state should have a description of this person in order that he may be apprehended and put in custody. The facts of the case are as follows:

About one year ago this man came to Dr. Mitchell's office and asked him for a loan, saying he was on his way home to Bowling Green, Ky., where his father, Dr. McCormack, lived. Dr. Mitchell asked him a number of questions, which he answered to his satisfaction, and finally gave him $10. He thought nothing more of the transaction for several weeks, when he failed to receive the money as promised. He then wrote to Dr. McCormack and received an answer that nothing was known of this party. In a very short time after this Dr. Mitchell began receiving letters from physicians all over the State of Illinois, saying that a young man of this description had called upon them, representing that he was Dr. Mitchell's son, and had in nearly every instance obtained a loan which they expected Dr. Mitchell to return. Most of them, however, had not been as generous as Dr. Mitchell, but had all given him something, except Dr. Everett J. Brown, of Decatur, who, suspecting that he

was an impostor, slipped out of his office and called up Carbondale by telephone, but unfortunately could not locate Dr. Mitchell. Had he succeeded, the gentleman would have been placed under arrest.

This party has undoubtedly found that doctors are an easy mark for this kind of prey and had started another campaign of the same kind this winter.

The swindler is said to be a tall man with wavy black hair, black eyes and rather good looking. His forehead is rather high and somewhat retreating. He looks to be about 25 years old and dresses quite well. Should any of our readers be approached by such a person, it would be well to call the police and put him under arrest as a swindler.

LADIES' AUXILIARY TO COUNTY MEDICAL SOCIETIES.

The Menard County Medical Society has branched out in a new way by the formation of a ladies' auxiliary, which has already held several meetings, both with and without the gentlemen. The success of this enterprise has been so marked that in all probability it will be continued. It is believed that the friendly feeling existing among the physicians in that association has been enhanced by the fact that their wives have become better acquainted, and have urged upon their husbands the desirability of continuing the scientific organization. It might be well for the ladies in other counties to undertake a similar movement.

LECTURE BUREAU OF THE STATE SOCIETY.

Elsewhere in our columns will be found the report of the committee at the recent meeting of the Council of the State Society, launching the project of a lecture bureau to be under the direction of the secretary of the State Society, and the lectures to be provided by volunteers from the larger cities of the state. The secretary wishes it distinctly understood that the list of lectures given is simply a start, and that any member of the State Society is eligible to have his name placed upon this list upon application to him.

It is believed by this means increased interest will be created in all of the meetings of the county societies, and the benefits to be derived will be in proportion to the alacrity with which the secretary and the program committees take hold of the plan.

It is understood that societies securing the services of the lecturers will report promptly in the columns of THE JOURNAL the results of the meetings, both for the benefit of the society in question and other societies contemplating the use of the services of the different gentlemen.

Other items of interest at the meeting of the Council were when Chairman Black was authorized to distribute to every member of the State Society a directory giving the names of all physicians in the state.

Arrangements were also made to canvass the advisability of levying an assessment for medical defense sufficiently large to pay any judgments which may be assessed as a result of malpractice suits. Many hundreds of physicians in the state are paying from $10 to $15 a year into the hands of insurance organizations for protection, which is little better, if any, than that which can be afforded by the State Society at a very small cost.

The present plan of medical defense has proved so successful that it is altogether probable a further advance along this line will be undertaken by the State Society in the near future.

Correspondence.

LONDON LETTER.

NELSON M. PERCY, M.D.

Junior Surgeon to Augustana Hospital; Attending Surgeon to St. Mary's Hospital; Instructor in Surgery, College of Physicians and Surgeons.

CHICAGO.

LONDON, Oct. 3, 1909.

VISIT TO THE CLINIC OF MR. ARBUTHNOT LANE.

Mr. Lane is very expert in his bone work. I have seen him use his steel plates in ten cases. He uses them in all cases of simple fractures. His results are most excellent. In simple fractures he never has to remove the plate, except occasionally, from the lower portion of the tibia in a laboring man who wears large boots. In compound fractures with infection he does not use plates unless he finds it impossible to secure fair apposition without. In these cases he usually has to remove the plates later. In recent compound fractures, he vaccinates the patient with staphylococcus before operating. He uses steel plates and screws, heavy enough to be very stiff. His success in simple fractures depends upon his very excellent aseptic technic. He operates without a constrictor, makes a long skin incision and then fastens gauze pads to edges of skin with special clips, walling off the wound completely from the surrounding skin. The entire operation is performed by instruments, nothing else touching the wound, not even the gloved finger. All sponges are handled with instruments, also the plates and screws. The bones are placed in perfect position by large special bone forceps. He uses no ligatures, and rarely any sutures. If the sutures are used they are handled entirely by instruments. Hemorrhage is controlled by crushing forceps. He closes the skin with clips. The bones are held so firmly by plaster that he rarely uses any splints in the dressing.

I saw a number of these cases operated on two or three weeks ago, and the wounds were all absolutely perfect. The interne told me that Mr. Lane never has the slightest infection in these cases. He does the

operation quickly. I saw him operate on two femora, a humerus and a radius in two hours. He takes *x*-ray pictures of all cases before and again the next day after the operation. Yesterday I saw the picture of a humerus and a femur operated on the day before. They were very clear, but the position was so perfect that we could not see the line of fracture. He operated on an ununited fracture of the radius yesterday. It looked fine. The plate holds the bone so firmly that the patient can use the arm immediately. All in all, I was very well impressed with his bone work.

Mr. Lane does a great many cleft palate operations. I have seen him operate on eleven of these cases. He does them quickly. Friday morning he operated on five cases in two hours. He prefers to operate during the first few days of life, for three reasons: 1. The mortality is high without operation, and few cases live to be two years old without an operation (in bad double clefts). Mortality with operation at early date is only 10 per cent. 2. Better immediate results with the early operation. 3. Better ultimate results are secured with the early operation.

Cleft Palate Operation.—On one side he raises a flap, including periosteum, beginning at the edge of the cleft and dissecting toward the alveolar process. On the opposite side he makes a flap toward the edge of the cleft. This flap is folded backward and the first flap sutured down on top of it by fine silk sutures. The sutures are placed the same as in overlapping in umbilical hernia operations. In the bad double cases the anterior portion of the cleft is closed by dissecting the greater portion of the skin and mucous membrane from the mandibular process and folding it backward into the roof of the mouth. In making this flap he leaves a small portion of the skin over the center of the mandibular process just below the nasal septum. He also utilizes the flap of the mucous membrane obtained by freshening the edges of the cleft in the lip. In repairing the lip he leaves the portion of the skin over the center of the mandibular process as an island in the center of the lip. In about 40 per cent. of his cases he has to perform a secondary operation upon the soft palate. The anterior portion of the cleft practically always heals completely at the primary operation. I think some of the failures in the soft palate are due to tying sutures too tightly.

Mr. Lane has done some appendix operations during my visit to his clinic, but there is nothing of importance connected with these.

Mr. Lane is very enthusiastic about his excision of the colon for chronic constipation with autointoxication. When the colon is dilated and long he makes an excision of the entire large bowel as far as the sigmoid flexure. In some cases where the colon is not long, he simply makes an anastomosis between the sigmoid and small intestine. I have seen him operate on two cases and have seen six other cases which he operated on from two to six weeks ago. All of the cases were doing well. All of them said they were greatly improved. His indications for operation are, chiefly, chronic constipation, emaciation, muddy complexion, flabby skin, cold hands, the coldness extending to the elbow and often to just below the shoulder. The cases I saw in the ward were supposed to

have all of these signs before operation. When I saw them they were all feeling well and the extremities were warm. I think Mr. Lane is over-enthusiastic about these cases, but I am convinced that there is something in it and that many of these patients are greatly benefited by the excision of the large intestine.

MR. FREYER'S CLINIC.

I have seen Mr. Freyer twice. He does splendid work. He does nothing but the suprapubic prostatectomy. He says it is impossible to remove the entire prostate by the perineal route without removing a considerable portion of the bladder wall. He has the prostate out in from two to four minutes from the time he makes his first incision. He distends the bladder with water, makes a three-inch incision, separates the recti muscles, then while he pushes the peritoneum upward with two fingers of one hand he makes an incision with a scalpel in the other into the bladder. He removes the entire prostate in one piece and irrigates the bladder with hot water until the hemorrhage is controlled. There is very little bleeding. He drains the bladder with a large rubber tube three quarters of an inch in diameter, sutures the skin wound tightly around the tube and attaches it to the tube. He places no sutures in the bladder. If I could do the operation as he can I would be converted to the suprapubic method.

He had a case of prostatic stones, with two perineal fistulæ. He removed 12 good-sized stones from the prostate through the perineum and laid open the fistulous tracts. There were no stones in the bladder. The stones were of the yellow smooth type "characteristic" of prostatic stones. He drained the bladder by inserting a half-inch stiff rubber tube.

I have seen him operate upon four cases of stricture of the urethra, but there was nothing of importance about these, except in one case of stricture in which he performed an external urethrotomy and drained the bladder by inserting a large catheter down through the urethra and fastening it in place. He places a catheter in all cases of stricture.

MR. LYNN THOMAS' CLINIC.

I went over to Cardiff, Wales, on Friday and had a most interesting day with Lynn Thomas. He had a patient with a very large goiter and a cretin. He transplanted the thyroid gland removed from the former into the latter patient. He used continuous ether anesthesia and did a very nice thyroidectomy. He was extremely careful about all blood vessels and had practically no hemorrhage. He drained with a glass tube, but used no gauze for drainage. As soon as the thyroid gland was removed it was placed in warm normal salt solution. The cretin was anesthetized and each tibia opened by a trephine half an inch in diameter. The hole was drilled into the center of the tibia and the bottom of this cavity was enlarged somewhat by a sharp curette. All hemorrhage was controlled by gauze packs; then the cavity in each bone was filled with thyroid tissue, the periosteum was sutured over the hole in the bone and the wound was closed. Mr. Thomas has operated on three of these cases, one eighteen months ago and the other two about six months ago. All of these cases are doing well. They had all been given thyroid extract

before the operation with benefit. In all of the cases in which thyroid administration was stopped before implanting thyroid tissue the patient did not do well. None of these cases have had any thyroid extract since the operation.

I saw another most interesting case, a woman, aged 50 years. Two years ago Mr. Thomas removed the entire thyroid gland for carcinoma. Symptoms of tetany developed in twenty-four hours. These symptoms disappeared upon administration of thyroid extract, which was continued for one year, and the symptoms returned immediately after its withdrawal. Thyroid extract was administered again and continued for six months. She has taken no thyroid extract for six months now and is perfectly well. No explanation has been offered as to why she can get on without thyroid extract now, but could not one year ago.

Mr. Thomas also had an interesting case of appendicitis which had been diagnosed as kidney stone. The *x*-ray showed a stone very distinctly, 2 cm. long and 1 cm. thick, situated midway between the crest of the ilium and the twelfth rib, three inches to the right of the spine. One could see the outline of the kidney clearly above this region. For this reason an anterior incision was made. The appendix was found behind the cecum and adherent to the lumbar muscles, and contained this large stone. The stone was composed of a crystalline substance, resembling a cholesterin gall-stone which must have been formed in the appendix.

Mr. Thomas performed a Lucas-Championnière herniotomy. The latter claims never to have recurrences. He ligates and excises the hernial sac, leaves the ligature long and by means of this ligature threaded on a needle pulls the stump of sac up behind internal oblique abdominal muscle, where it is fastened by suturing up through the muscle. He places no other stitches in the internal oblique muscle, but closes the hernia by simply overlapping the external oblique. The lower stitch used in the overlapping also passes through the conjoined tendon.

I also saw him operate on a case of carcinoma of the breast and one of a large ovarian cyst in which there was nothing unusual to report. Mr. Thomas wears cotton gloves. His asepsis and technic are very good. He is the only man I have seen who takes off his citizen's clothes while he operates.

He applies a paste of iodoform and bismuth to all wounds and claims that it prevents any redness about the stitches. I saw several wounds and they were all perfect.

MR. BLAND SUTTON'S CLINIC.

I have seen Mr. Sutton do some work. He is a rapid operator. He did an abdominal hysterectomy very nicely, but used heavy silk for everything; no catgut. He closes the abdominal wounds with one row of through-and-through heavy silk sutures.

In a case of pylorectomy for old ulcer he removed only one-half an inch of tissue on either side of the pylorus and made an end-to-end anastomosis. The entire operation consumed only fifteen to twenty minutes. He used only two pairs of forceps. These were placed obliquely across the duodenum and pyloric end of the stomach, respectively, the end of the

two forceps coming together behind the pylorus. These forceps acted as both hemostats and anastomosis forceps.

I also saw Mr. Handley do some cases of tuberculosis of the hip with abscess. He opened the abscess, evacuated the pus and closed the wound completely without introducing any form of medication.

BEWARE THE BOOK THIEF

To the Editor: Last June I had three books stolen from my office, one a Casey Wood's "Ophthalmic Therapeutics," Ballenger's "Ear, Nose and Throat" and Barnhill's "Modern Otology." These were taken by a tall, medium-weight man with dark hair and moustache slightly gray. He was of good address and carried a brown grip. He came at the lunch hour and was seen by the elevator boy, who took him for a book agent.

In August I found the "Ophthalmic Therapeutics" in a Chicago store and if I can find who purchased the other two I may be able to locate the thief and thus stop his work. I do not care for the books, but would like to know who bought them.

The above information may save other members the loss of books.

Fraternally yours,

J. A. PRATT, M.D., Aurora, Ill.

REMEMBER THE NATIONAL MAGAZINE.

To the Editor:—During the summer months there has been running a series of articles in the *National Magazine*, edited by Chapple Publishing Co., Boston, entitled "The Doctors' Trust." It seems to me that the attention of the doctors should be called to this article. It should be resented if by nothing more than by the withdrawal of your subscriptions.

Yours truly, F. T. BRENNER, A.M., M.D., Quincy, Ill.

Oct. 5, 1909.

THE PRESENT STATUS OF OBSTETRICAL TEACHING IN EUROPE AND AMERICA.

The president of the American Gynecological Society has appointed a committee to report at the next annual meeting in Washington on the Present Status of Obstetrical Teaching in Europe and America, and to recommend improvements in the scope and character of the teaching of obstetrics in America.

The committee consists of the professors of obstetrics in Columbia University, University of Pennsylvania, Harvard, Jefferson Medical College, Johns Hopkins University, Cornell University and the University of Chicago.

Communications from anyone interested in the subject will be gladly received by the chairman of the committee, Dr. B. C. Hirst, 1821 Spruce Street, Philadelphia, Pa.

COUNTY AND DISTRICT SOCIETIES

ADAMS COUNTY.

The meeting of the Adams County Medical Society, held September 13, 1909, was an all-day session which began with a gynecologic clinic at Blessing Hospital at 9:30 a. m. This was conducted by Dr. Channing W. Barrett, of Chicago. The case was an excellent one and upon it were demonstrated the following indicated operations: Amputation of the cervix, an anterior colporrhaphy for cystocele, a perineorrhaphy, curettage; through the abdominal incision the round ligaments were shortened by a modified Alexander operation, a diseased ovary and appendix were removed. The entire time for the operations was but one hour and a half. The technique and beautiful results shown were highly instructive and enjoyed by a large attendance of the members. At noon the society had luncheon together at the Hotel Newcomb. In the afternoon the business and scientific session was called to order by President Hart. Those present were Drs. Knapp, Bloomer, Ashton, Christie, Grimes, Gilliland, J. B. and Kirk Shawgo, Ericson, W. W. and J. G. Williams, Spence, Nickerson, Rice, Brenner, Schullian, Ball, Knox, Groves, Mitchell, Montgomery, Zimmermann, Davidson, Koch, Nichols, Haxel, Werner, Wessels, Knapheide and Wells. Also Drs. Mercer, Green and Whipple. There being a vacancy on the Board of Censors caused by the death of Dr. Jos. Robbins, a motion prevailed that it be filled. Drs. Nickerson and Kirk Shawgo were placed in nomination, the vote resulting in the election of the former. Dr. Channing W. Barrett, of Chicago, was then introduced and spoke on the subject of "Perineal Herniotomy in Its Relation to the Cure of Procidentia," in which the following points were emphasized:

1. Prolapse of the pelvic organs is common; very few women passing through childbirth without some degree of traumatism which predisposes to hernia through the vagina.

2. The abdomino-pelvic organs are supported by ligaments and the abdominal walls, the pelvic floor in man being the most important part of the wall, it being the lowest.

3. The tail muscles of the four-footed animals develop into the diaphragm of Meyer—the levator muscles to meet this need of support in man.

4. Atavism and traumatism of the levator ani muscle and its fascia predisposes to hernia by weakening the strong posterior segment and allowing the anterior movable segment to bulge into the opening. These conditions, slight or extreme, constitute some degree of hernia.

To cure these hernias the following points must be observed: A good pelvic floor must be constructed; the vagina must be gotten out of the vertical line; redundency of vaginal tissue allowing cystocele must be corrected. The uterus must not be left in line with the vagina. If the patient is past child-bearing or the uterus pathologic and the degree of hernia marked, the uterus may be removed, when it is very important that the stump of its ligaments be planted into the upper part of the vagina. If the degree of the prolapse is not marked, the uterus fairly healthy, and especially if the patient is of a child-bearing age, the uterus may be put out of line with the vagina by shortening the round ligaments through the rings or by shortening the sacro-uterine ligaments or in some cases both, or by means of Alexandoff's operation; that is, bringing the lower part of the broad ligaments in front of the cervix per vaginum. If the uterus is left, pathologic conditions in the cervix should be corrected. Cystocele should be corrected, not by scarification but by excision of an elliptical portion of the vaginal wall. In reconstructing a pelvic floor, stress was laid upon going deep enough to get the levator muscle and dealing with this anatomic structure definitely as we

would deal with muscles in the cure of inguinal hernia, bringing them together in the median line between the rectum and vagina. Much stress was also laid upon making the flap at the vagino-vestibular junction, instead of out upon the labia, that the normal vestibule may be preserved and the labia not closed over the vaginal opening. By this procedure the vagina is not closed but crowded forward out of a vertical line and a strong posterior segment created.

The lecture was well illustrated by charts and models and was one of the most interesting and instructive discussions the society has ever had. Dr. Barrett is a clear, lucid speaker and makes every proposition very plain and simple. At the conclusion of his address the speaker replied to many questions, the answers to which brought out many more valuable points. Dr. Gilliland, in moving a vote of thanks to Dr. Barrett, included in his motion that the doctor be elected to honorary membership in the Adams County Branch. The vote of thanks and election were unanimously carried. A vote of appreciation was also given Miss Wheeler and the management of Blessing Hospital for their cooperation and assistance in the matter of the clinic and for past privileges along the same line. On motion the society adjourned.

CLARENCE A. WELLS, Secretary.

COOK COUNTY.

CHICAGO LARYNGOLOGICAL AND OTOLOGICAL SOCIETY.

Regular Meeting, February 9, 1909.

A regular meeting was held Feb. 9, 1909, with the president, Dr. Henry Gradle, in the chair.

TRAUMATIC DISLOCATION OF THE NOSE AND UPPER LIP.

Dr. W. L. Ballenger reported a case of a man who was carried two hundred feet by a cyclone, falling violently on his face. The nose and upper lip were severed from the face, and in healing the nasal vestibule rested opposite the gums, with the result that there was complete occlusion on one side and a very small opening on the other. As the result of operative intervention the man has now perfect breathing space, and his appearance has been somewhat improved.

REPORT OF A CASE OF RHINOSCLEROMA.

Dr. Stanton A. Friedberg. Female, aged 21, born in Austrian-Poland. First came under observation in February, 1908. Illness had begun about four months previously with a sensation of dryness in the nose. A month later the laryngeal symptoms developed. These consisted of dryness, cough, increasing hoarseness and dyspnea. The first examination showed marked nasal involvement confined principally to the turbinals. No external lesions. Nasopharynx slightly involved. Marked subglottic involvement with limitation of the movements of the vocal cords. Palliative treatment with bougies carried on for about two months when tracheotomy had to be performed. Patient wore a tube for nine months. This has recently been removed. In addition she has had *x*-ray treatments. Examination at present shows the process in the nose to have reached the terminal stage of contraction. There has been no extension in the nasopharynx. A nodule is found on each posterior pillar in the pharynx. The subglottic swelling has diminished greatly, so that now there is practically no obstruction to the entrance of air. The movements of the vocal cords have been restored to a considerable degree, the right more than the left. Whether the *x*-ray treatment or the rest obtained by the larynx through the wearing of the tube has brought about the improvement it is impossible to say. Likewise it remains to be seen whether the improvement will be permanent.

Dr. J. C. Beck saw Dr. Friedberg's case of rhinoscleroma before the treatment was begun, and notes a decided improvement. In a case which he had previously seen in Prague the objective findings were not so marked as in Dr. Friedberg's case. A positive diagnosis in these cases is made when one finds the exciting cause. In cases of ordinary papilloma of the vocal cords, Dr. Beck has obtained very good results by forcing physiological rest and inserting a tracheotomy tube.

Dr. F. G. Stubbs referred to a case of rhinoscleroma which he presented to the society two years ago. In this case a very small triangular opening was the only passage through the larynx. When mucus filled this opening the patient could hardly breathe. He dilated with Schrötter's tubes up to No. 3, continuing the dilation for two months. The *x*-ray was also used, but no improvement noted. She was seen a year later, when the conditions remained as they were after the dilation.

Dr. E. L. Kenyon considers that the tawny color of the mucous membrane and the subglottic infiltration are characteristic of rhinoscleroma. He used the *x*-ray on a case where the soft palate was extensively involved, but failed to note any effect, although the treatment was continued a long time. While it is a fact that rhinoscleroma of the outer surface of the nose has been decidedly improved by the *x*-ray, he does not hold that the mucous membrane of the larynx would be similarly affected by the rays passing through the cartilage.

Dr. O. T. Freer does not consider the subglottic infiltration particularly characteristic of rhinoscleroma. He has frequently seen just such swellings in tuberculosis of the larynx.

Dr. R. M. Fletcher has recently seen a number of cases of rhinoscleroma in Vienna, and thinks the findings in Dr. Freer's case are sufficiently characteristic to warrant a diagnosis even without the histological findings.

Dr. Friedberg (in closing) stated that he had employed dilatation for several months, but had only succeeded in introducing a No. 2 Schrötter bougie. The obstruction was so great that he was forced to do a tracheotomy. In regard to the use of the *x*-ray in the case referred to by Dr. Kenyon, he is of the impression that the disease had practically reached the terminal stage before the *x*-ray was applied, and one could hardly expect any treatment to prove effectual under those conditions.

LARYNGEAL CASE FOR DIAGNOSIS.

Dr. S. A. Friedberg:—The patient, man aged 40, first noticed hoarseness about four years ago, which has steadily grown worse. A fair sized bougie can be passed without difficulty. There is an infiltration at the anterior end of the left vocal cord, which appears to be cystic, but no fluid could be withdrawn through the aspirating needle. Infiltration presses the vocal cord outwards.

Dr. H. Kahn does not consider the case a malignant one, but thought the diagnosis of a myoma was suggested both by the history and the slow growth of the tumor.

CAVERNOUS ANGIOMA OF THE BUCCAL CAVITY.

Dr. R. H. Good presented a girl who since birth has had a tumor on the inner aspect of the right cheek, extending from the angle of the mouth back to within one-half inch of the anterior pillars of the fauces. Its color was bluish and surface quite irregular. By pressure the size could be diminished at least one-half. There was no pulsation, no pain or discomfort. Mastication is not interfered with and there have never been hemorrhages.

Dr. Good also exhibited two illustrations of a case of angioma of the tongue.

DISCUSSION.

Dr. Joseph C. Beck referred to a case of angioma of the cheek involving the soft palate, which he presented to this society four years ago. This case had been operated upon by Dr. Senn without securing relief, and later by Dr. Beck. Injections of hot water had failed.

Dr. Carl Beck operated on these cases by inserting interrupted catgut ligatures into the mass, tying these only sufficiently tight to produce gradual starvation of the tumor, and not actual necrosis. Radium had been found of no value in these cases.

Dr. H. Kahn referred to a case of bleeding polyp in the nose, which he had operated on by means of a pursestring suture around the pedicle of the tumor. After cutting off the polyp the ligature had slipped, and the hemorrhage that had ensued was so severe that it took four hours before he succeeded in checking it.

Dr. A. H. Andrews stated that he would do one of two things in these cases of angioma, either ligate the vessels that enter the mass and then employ negative galvanism or else let the tumor alone.

Dr. Ballenger would use positive galvanism instead of the negative, because what the tumor needs is coagulation and not liquefaction. If he would use galvanism at all, he would use several needles at once, with about twenty-five milliamperes of current for five or ten minutes, repeating applications from time to time, as seemed necessary.

Dr. J. G. Wilson exhibited an anatomic preparation showing dissection of the muscles around the mouth of the esophagus. This preparation showed a small triangular area just beneath the inferior constricture of the pharynx, in which the muscle fibers were entirely absent. Dr. Wilson called attention to the work recently published by Killian on the anatomy of this region, and pointing out the weakness of this particular area as an important etiological factor in the production of esophageal diverticulum.

Dr. J. C. Beck inquired of Dr. Wilson how he would account for the formation of a lateral esophageal diverticulum if the esophageal pouches were the result of the stretching of the weakened area in the middle of the posterior wall as described by Dr. Wilson. Dr. Beck referred to a case of lateral diverticulum of the mouth of the esophagus which he had filled with bismuth for diagnostic purposes.

Dr. Stubbs inquired of Dr. Wilson how long a spasm of the superior constrictures usually lasted. He had seen a case recently in a man of forty-seven years of age, where the spasm persisted for twenty-four hours.

Dr. Kenyon had seen a case several years ago in which the spasm was so severe that the patient was unable to swallow anything, and it was impossible to pass a bougie for over twenty-four hours.

Dr. Wilson (in closing) stated that he did not know what the usual length of time was the spasm persisted. A spasm of moderate severity had been known to last for several days. Severe spasms usually pass more quickly. In the case of lateral diverticulum cited by Dr. Beck, he thinks it very likely that the mouth of the diverticulum was posterior, but that the sac had been pushed to one side on account of the anatomical relations.

A DISCUSSION OF THE PHYSIOLOGY OF THE COCHLEA.

Dr. Geo. E. Shambaugh, in discussing the physiology of the cochlea, called attention to the existence in the labyrinth of three distinct types of end organs; the macula acustica in the vestibule, the crista acustica in the semicircular canals and the organ of Corti in the cochlea. The older physiologists looked upon the labyrinth of the ear as a mechanism solely interested in sound perception, and they distributed this function over these three types of end-organs as follows: Tone perception to the organ of Corti, noise perception to the macula acustica, and the ability to determine the direction from which sound comes to the crista acustica. The physicists have been able to demonstrate that no fundamental difference exists between a tone and a noise, so that the necessity for two types of end-organs in sound perception is uncalled for. It has also been demonstrated by physiological research that the semicircular canals have a function quite distinct from that of hearing. The present view is that all sound perception takes place in the cochlea, whereas the end-organs in the vestibule and in the semicircular canal have to do with the function of equilibrium.

When Helmholtz undertook the study of tone perception, his efforts were directed to the explanation of the most conspicuous phenomena connected with tone perception, that of tone analysis. If a number of tones are sounded at the same time, the complex wave that impinges upon the organ of hearing is analyzed by this organ into its component parts, so that we are able to recognize each of the original tones. This phenomena of tone analysis has an every-day analogy in the principle of physical resonance. If, for example, a number of tones are sounded in an open piano forte, the complex wave that impinges upon the piano strings will be analyzed by these strings, so that the strings in the piano corresponding to each one of the original tones will be set to vibrating. This fact suggested to

Helmholtz that a similar mechanism of physical resonators existed in the cochlea, arranged in such a way that in the perception for the high tones there would be a response in one part of the cochlea tube, and for the low tones in another. Helmholtz then examined the cochlea in order to find, if possible, a structure which would fit this theory. The rods of Corti appeared to him as structures which might take up the function of rod resonators. This idea had to be given up when it was shown that in birds and crocodiles the rods were wanting. Helmholtz then selected the radiating fibers of the membrant basilaris as the resonators. These fibers, longer at the apex of the cochlea, should respond to the low pitched tones, while those at the base of the cochlea, being shorter, should respond to the high pitched tones, and in vibrating bring about a stimulation of the superimposed hair cells. Various modifications of the theory of tone perception that have been suggested since the time of Helmholtz all retain the idea that the active structure in bringing about a stimulation of the hair cells is the membrana basilaris.

Dr. Shambaugh's work on the problem of the physiology of the cochlea was undertaken from quite a different viewpoint. He became primarily interested in the embryology and in the histology of the end-organs found in the labyrinth. A study of the internal ear in this way leads to conclusions regarding the function of the various structures in the organ of Corti which are different from those reached by Helmholtz.

From a study of the development of the labyrinth it is found that the three types of end-organs which are located in the internal ear all have a common origin in the primitive otic vesicle. A careful study of the histologic details of these three end-organs shows us that fundamentally they have exactly the same structure, that they are made up of peculiarly specialized epithelial cells, which have hair-like processes, and that above these hair cells there is suspended in each instance a peculiar structure derived from the epithelium. This similarity suggests very strongly that they are all three derived from a common primitive end-organ. This overhanging epithelial structure in the vestibule is the otolith membrane. In the semicircular canals it is the cupola, and in the cochlea it is the membrana tectoria. The stimulation of the hair cells in each instance is brought about by an interaction between the hairs of the hair cells and this overhanging epithelial structure. Now it is clear that this intersection is brought about both in the vestibule and in the semicircular canals by a movement in the otolith membrane and the cupola respectively. It is therefore logical to assume that in the organ of Corti the interaction between the hair cells and the membrana tectoria is accomplished rather by the movements of the membrana tectoria than of the membrana basilaris.

If we subject the membrana basilaris to a critical study we will find a number of conditions which make it impossible for this structure to perform the function of resonator as embodied in the Helmholtz theory. In the first place, this structure disappears as a vibrating mechanism at some distance from the beginning of the basal coil. In the second place, if this membrane consisted of a series of string resonators, we would expect to find that as the fibers become shorter they would also become thinner. Just the opposite is the case. Invariably the shorter the fibers become, the thicker they become. In the third place, there is attached to the under surface of the membrana basilaris a blood vessel which must dilate or contract, depending upon the blood pressure. This would interfere fundamentally with the principle of the Helmholtz theory, which requires that each radiating fiber must always vibrate for the same tone. The logical conclusion from these facts seems to be that the membrana tectoria, and not the membrana basilaris, is the active agent in stimulating the hairs of the hair cells.

Just how the membrana tectoria responds to the impulses of the various tones passing through the endolymph is not easy to determine. Any conclusion as to its probable action must, of course, be more or less speculative. Of the possible modes of action, three suggest themselves. One is that for each tone the whole membrane is thrown into action. The second is that the high tones stimulate but a small part of the tectorial membrane at the beginning of the basal coil, and that each tone lower in the scale stimulates a larger and larger part of the membrane.

The third is that the membrana tectoria responds in its several parts to tones of different pitch, in the basal coil for the high pitched tones, and in the upper coils for the lower tones. In order to determine which hypothesis is the probable one, we must keep in mind the phenomena that must be accounted for. There are, in the first place, the phenomena of tone analysis; in the second place, the so-called secondary phenomena of tone perception, and finally the occurrence of tone islands. The phenomena of tone analysis can possibly be accounted for by any of the three hypotheses. The secondary phenomena of tone perception are accounted for most plausibly if we assume the third mode of action. Finally, the phenomena of tone islands, or of defects in the middle of the tone scale, can, it seems, be accounted for plausibly only on the assumption that the membrana tectoria responds in its several parts to tones of different pitch, thus acting in the manner of a physical resonator. The final conclusions are that the membrana tectoria is the agent which, by responding to the various tone impulses passing through the endolymph, stimulates the hair cells of the organ of Corti, and brings about tone perception. The manner in which the membrana tectoria responds to the various tones appears most probably to be by separate segments responding to different tones, the high pitched tones in the basal coil, the lower tones in the upper coils.

Dr. Holinger inquired whether the anatomical facts relating to the membrana basilaris which Dr. Shambaugh cited, were those found on embryonic specimens, or from specimens taken from normal-hearing human adults. He stated that the point has been made that the mechanism of hearing is not the same in man as in animals. If this is true, conclusions based on anatomical data derived from the lower animals could not safely be applied to the function of hearing in man. He thinks that the tectoria membrane is a soft structure that is more suited to dampen the sounds than to intensify them, somewhat like the soft pedal on the piano. It was not clear to him how the same hair cells in the organ of Corti, even when grouped differently for different tones, could result in tone analysis, as Dr. Shambaugh had pointed out.

Dr. J. G. Wilson emphasized the fact that Dr. Shambaugh had arrived at his conclusions regarding the physiology of the cochlea by beginning with a study of the embryology of this organ, and continuing with a painstaking study of the adult anatomy, and that finally his work led up to a discussion of the probable physiological function of the structures. This method of procedure is now recognized to be the proper scientific method for working out any new question in physiology. Dr. Shambaugh has been an enthusiastic worker on the labyrinth of the ear, and Dr. Wilson thought this enthusiasm might perhaps be urged by some as objections to his results. Dr. Wilson stated he still was a believer in the telephone theory, which in the discussion Dr. Shambaugh referred to as a discarded theory. He thinks the telephone theory as we now see it, as well as the resonator theory of Helmholtz, as understood to-day, is quite different from either of these theories when they were first brought out. He said that Dr. Waller, of London, was a prominent exponent of the telephone theory to-day. This theory refers the ultimate analysis to the brain.

Dr. Shambaugh's anatomic points have been substantiated by other workers. There are still some questions where difference of opinion exists. If he understood Dr. Shambaugh correctly, the hair cells in the three types of end-organs found in the labyrinth are peculiar in the histology of these special sense end-organs. This may not be strictly true, since there are other end-organs with hair-like filaments. He does not believe that the ear is capable of recognizing absolute pitch.

Dr. H. Gradle considers the work by Dr. Shambaugh as in a measure a corroboration of the fundamental hypothesis of the Helmholtz theory of tone analysis. The workers on the cochlea are to-day in possession of more detailed anatomic knowledge than was Helmholtz. On the other hand, Helmholtz was a master in physics, and it was this knowledge that made it possible for him to construct his work on the hypothesis of tone analysis. He thinks the fact that the membrana tectoria is not a homogeneous structure, but a very complex one, is an evidence that it may be possible for its different units to analyze the impulses from the various tones which pass through it into the hair cells. Any theory to-day which

refers tone analysis to the labyrinth must necessarily also take into consideration the well known pathologic phenomena. One is that the labyrinth may be thrown out of tune by certain diseased conditions producing the well known condition of displacousis. This condition seems to be produced sometimes in cases where there is evidence only of a slight middle ear catarrh.

Dr. Andrews thought that there was a somewhat similar condition of things in the eye, although the media through which impressions were carried is different. He thinks it is possible to conceive of sound waves passing through the fluids of the labyrinth affecting the hair cells directly without the intervention of either a membrana basilaris or a membrana tectoria.

Dr. Shambaugh (in closing):—The anatomical material from which the data regarding the basilar membrane had been derived was the new-born pig, which represents the adult condition since the labyrinth, like the other special sense organs, is fully matured some time before birth. He does not believe there is any reason to doubt but that the fundamental facts regarding the function of hearing is the same for the lower animals as for man. Where structures are so alike throughout there is no reason to believe that a different mode of function exists in one species from that in others.

Dr. Holinger's fear is hardly warranted that a confusion of tones must arise where the same hair cells are stimulated for different tones only in different groups. From the standpoint of the psychologist, all that is necessary to account for the phenomena of tone analysis is that there should be a different group complex of hair cells stimulated for each particular tone.

Dr. Wilson's suggestion that an enthusiastic worker is liable to draw false conclusions, is hardly to the point. Enthusiasm is always necessary to accomplish any painstaking work. The question is rather whether one is able to recognize anatomical facts as they exist, and whether one is capable of drawing logical conclusions from established facts.

The evening is already so late that it would not be feasible to take up the discussion of any further points at this time.

Meeting, March 9, 1909.

The Chicago Laryngological and Otological Society met March 9, 1909, with the president, Henry Gradle, in the chair.

Dr. Harry Kahn presented a case of foreign body in the maxillary sinus. A man, over fifty years of age, luetic for thirty years, nine years ago developed pains in the legs and other tabetic symptoms. Seven years ago vision began to fail and a diagnosis of tabes was made. Vision rapidly became worse, and the man is now totally blind. About four years ago he placed himself under the Cooper treatment and was injected many times. He became salivated, and lost most of his teeth, except the first and second upper molars on the left side. Then he had a plate made, but as his gums shrank considerably the plate would not remain in place. He then devised the expedient of sticking a toothpick beside the first molar to act as a wedge. This tooth loosened so much that extraction was resorted to. The socket did not heal, and on examination pus was found exuding. Dr. Kahn punctured the maxillary sinus, and found it to contain a considerable amount of pus. At the second puncture he discovered an anesthetic area on the gums. Finally, the sinus was curetted and a piece of toothpick, about three-fourths of an inch in length, was removed. Evidently this had been the cause of the trouble, because recovery followed immediately.

Dr. William L. Ballenger, in discussion, stated that some years ago he had seen a case of suppuration of the antrum which had previously been treated by a local specialist, who introduced a drainage tube into the antrum. After a time the tube disappeared and it was presumed to be lost. The suppuration continued, however, with increasing severity. Some months later the patient had a violent fit of sneezing, during which the drainage tube was ejected from the nose. The suppuration then abated, and a cure was greatly effected.

Dr. D'Orsay Hecht first saw the patient in January, 1908, and said it required not a very thorough examination to pronounce the case one of frank tabes, presenting, however, unusually interesting features, two of which he desired to particularly emphasize. It was to be observed that the patient walked well, while, on the other hand, it was to be noted that he was blind. Curiously enough, he walked well because of the blindness. Dr. Hecht said that the blindness developed early and belonged to that category of tabes cases known to neurologists and ophthalmologists as the amaurotic type, in which the motor symptoms were known to remain in check; held in abeyance. So constantly true was this clinical fact, that Dr. Hecht could conscientiously follow a neurologic dictum of years' standing namely, to give patients with rapidly failing vision the assurance that they need have little or no concern about an impairment in their gait. The patients who could not see would walk well; the patients who could not walk well need have no fear of losing their eyesight.

The second feature, Dr. Hecht said, had to do with sensation. He stated that the sensory disturbances in tabes were many in kind and varied in location, the analgesias affecting chiefly the lower extremities, whereas the anesthesias appeared more often in a zonal distribution on the trunk, corresponding to cord segmental distribution. He would add that testicular and ulnar analgesia, together with delayed sensory impressions, were also present in the patient presented, but only in a slight degree. He desired to call attention to one of the rarer forms of sensory involvement affecting the fifth cranial nerve, which, as it occurred in this case, proved most interesting. The trigeminus was anesthetic and hypalgesic both in its ophthalmic and superior maxillary divisions, in support of which Dr. Hecht passed for inspection several sensory charts with outlines of sensory disturbance in the extent mentioned. It was of further interest to note, in passing, that the patient was unable to recognize the position of a bolus of food in the mouth, readily explained by the fact that the fifth nerve supplies, in addition to the entire integument of the face, the mucous membrane of the mouth, the nose and antrum of Highmore. The insensitiveness to pain enabled the puncture and instrumentation of the antrum without the least discomfort to the patient. Although not demonstrable now, there had at one time in the earlier course of the disease been present an hallucination of smell, in other words, a parosmia.

Dr. Henry Gradle showed specimens of a tonsil injected with bismuth paste, and then serially sectioned to demonstrate a communication of the various crypts of the tonsil with one another.

Dr. Joseph C. Beck demonstrated the method of injection of the tonsil with bismuth paste, a method he has employed in several cases of acute inflammations. Although the patients have returned subsequently, with attacks of tonsillitis, they were not so severe, either locally or constitutionally.

Dr. J. Hollinger reported the case of a man who became ill three months ago, with symptoms of vomiting, dizziness and staggering gait. The patient's condition has been apparently improved about 75 per cent. by the inflation of the middle ear with air. Mercury and potassium iodid are also being administered, although there are no manifestations of lues and the patient denies infection. The general diagnosis is lues of the brain and spinal cord. He has analgesic zones on the legs and face. The tuning-fork tests show simple nerve deafness. He hears whispered voice in both ears about five meters. The Rinné test is normal. The Weber-Schwabach for small á is positive and for capital A is negative. The upper tone limits are lower than normal. He hears sixteen vibrations quite well in both ears. Injecting a cold solution in the ear produces a normal reaction. The nystagmus is especially bad when looking toward the side not injected. The reflexes are diminished.

Dr. George E. Shambaugh, in discussion, stated that although one frequently hears of cases of aural vertigo caused by middle ear disease, a good explanation has never been made as to how a continued increase in labyrinthine pressure could cause the vertigo. If this patient is suffering from a neuritis of the acustic nerve the symptoms could be explained very readily. If the ear trouble has come

on only several months ago, and is of the internal ear type, as the tests show, it is probably due to a neuritis of the acustic nerve, and the continuation of the irritation of the vestibular portion of the nerve is the cause of the vertigo.

Dr. D'Orsay Hecht said that since neurologic comment had been invited by Dr. Holinger he felt disposed to differ in regard to the inflation test just applied to show an improvement in the patient's ataxia. He thought no inference should be drawn from this demonstration. As concerned the diagnosis of cerebrospinal lues in this case, he could not reconcile himself to such a conclusion, based upon the symptoms referred to. Dr. Holinger had not remarked about the pupillary condition, nor those of the reflexes, and he did not think that a diagnosis was tenable when based upon "poor" reflexes, and such subjective symptoms as headache, vomiting, and a questionable degree of static ataxis, as shown by the Romberg sign. He thought that these symptoms, vague as they were, might indicate any one of a number of cerebrospinal, cerebral or meningeal conditions. He added that he had frequently noted marked improvement in vertigo of the aural type as the result of significance in the diagnosis of Ménière's disease. He was not prepared to venture a neurologic diagnosis, as he had not examined the patient.

Dr. D'Orsay Hecht said, in answer to Dr. Shambaugh's inquiry concerning the physiological explanation of the retardation of the ataxia in the presence of amaurosis, that he had nothing adequately scientific to offer, but it was a well known fact that visual concentration upon motor effort increased motor incoordination. He added that a woman with tabes will never present as much ataxia of gait as will a man, for the reason that she can not see herself walk because of the intervening drapery in the form of her skirt.

In the Fränkel exercise treatment of the ataxia of tabes an attempt at reeducation is made by exacting precise maneuvers at a better coordination without the aid of the visual apparatus. This is as much as Dr. Hecht could venture to explain.

Dr. Holinger stated that this was the first day that the man had retained three meals. The day that an inflation is made he does not vomit at all, but the next day the reaction is pronounced. For about eight days he has been getting hypodermic injections of mercury and potassium iodid, and all of the symptoms have improved considerably. The vestibular apparatus certainly is not paralyzed, because there exists a pronounced nystagmus.

Dr. Joseph C. Beck presented a lady whose cervical glands were removed some time ago, and who now has a fistula. There is a condition in the mouth that is peculiar. A mass occupies the site of the posterior pillar of the fauces, somewhat simulating a tonsil behind the posterior pillar, and the space between anterior and posterior pillars is obliterated. The question is whether this mass to which the fistula leads is tuberculous in nature.

Dr. O. J. Stein suggested that this mass might be a cold tuberculous abscess, particularly inasmuch as it had existed for about three months.

Dr. Robert H. Good read a paper entitled "Early Immunization; The Essential Function of the Tonsil."* He discussed the hypothesis that the tonsillar crypts acted as test tubes for the reception and cultivation of bacteria of the different diseases which affect the human organism, and that a gradual process of immunization results, his conclusions being that during the first few years of life is the time when the individual is in greatest need of protection against the various infectious diseases, and it is during this period that the tonsil performs its chief physiological function. It is only occasionally in later life that the tonsil has this function to perform. He concludes that in children under two or three years of age it is unwise to remove the tonsil completely. It is only the markedly diseased tonsil that should be enucleated. He further concludes that when the tonsil once becomes diseased its function is so altered that it is possible for it to become a portal for systemic infection.

Dr. C. M. Robertson questioned the statement that the tonsil has a function. He is inclined to believe that it has no function whatsoever, certainly not at birth,

* For text of paper see page 186, August issue.

when it is completely covered over by the plica tonsillaris. Shortly after the second year this fold disappears, and the function of the tonsil, if such exists, may commence. The tonsil develops up to the fifth or sixth year, and then rapidly atrophies, so that at the age of puberty it has practically disappeared. Therefore, if the tonsil has any function at all, it is between the ages of two and ten years; after that it is a pathologic organ.

As for the statements made regarding the glands and ducts, that is not new, although the opening of the duct into the crypt is a new discovery, if really true. The duct is situated down at the bottom of the crypt in the capsule and passes up into the trabeculæ. The mucus expelled from the crypt is slight in quantity, just sufficient to keep the surfaces of the crypt lubricated.

As to the phagocytosis: The lymphocyte coming from the tonsil, not going into it, is not a phagocyte, and, besides, the pouring out of the opsonins is necessary before the lymphocytes can become phagocytic. The location of the tonsil is such that in respiration it is closed off from the respiratory tract. The posterior pillar of the fauces is a broad muscle, five or six times as large as the palatoglossus muscle, so that the tonsil is pressed up against the tongue, and excluded from the respiratory tract. Dr. Robertson considers Fox's theories all wrong; at any rate, they have never been proved to be correct. As a digestive organ, the tonsil has no function at all. That has been shown repeatedly by experiments; nor has the tonsil any bactericidal action.

As regards the formation of antibodies, such an action has been suggested but has not been proved. Vaccination in tonsillitis would prove that quite readily.

Dr. Otto T. Freer:—Dr. Good's discourse leaves the impression that he has reasoned out for himself a theory of the function of the tonsils based upon a literary review and deductions therefrom, rather than upon the clinical and laboratory research which his assertions demand as a backing, if they are to be taken seriously. His paper consists mainly of unproven and to a large extent unprovable hypotheses, and is not, it seems to me, a record of demonstrated facts.

For example, the mucous glands in the fibrous envelope of the tonsil, called by Dr. Good paratonsillar glands, are declared by him to be the seat of origin of peritonsillar abscess. To make this more than mere dogmatic assertion, Dr. Good should have furnished microscopic specimens showing in these glands the beginnings of a peritonsillar abscess, which would appear as dense round-celled inflammatory infiltration associated with necrosis of the glandular epithelium.

In another part of his paper Dr. Good refers to the crypts of the healthy tonsil as the analogues of test tubes containing cultures of bacteria, and makes the statement that bacterial agglomeration in the crypts has an immunizing effect on the body in the course of time. Had he shown histologically such massed gatherings of micro-organisms in the crypts, he would have at least had some support for his hypothesis. As it is, his description is contradicted by every day experience, which shows the crypts of healthy parts of excised tonsils to be empty of anything but clear transparent mucus, which has no resemblance to the opaque bacterial cultures familiar to all the test tubes. To be sure, cultures of bacteria contained in fibrinous exudate clinging to the walls of the crypts are seen in follicular tonsillitis. This is, however, an inflammatory and not a physiological condition.

Dr. Harry Kahn said that the essential facts of Dr. Good's paper were read by Dr. Orendorf in Indiana in 1907, and in that paper he positively states that his conclusions were based on the examination of tonsils excised by Dr. Good. Therefore, it is impossible to arrive at an estimation of the true value of the theories advanced by Dr. Good with regard to the function of these tonsils. He considered it an assumption on Dr. Good's part to formulate a theory based on mere supposition and not on experimental facts. The entire paper is a theory without any foundation.

Dr. Good, in closing, said it was unreasonable to suppose that any organ having a lymph current draining into it, and having the function of throwing off leucocytes into the crypts, having pockets and mucus draining into these pockets, was without function. Instead of there being a small amount of mucus in these

crypts, there is a considerable amount. And that the plica tonsillaris, or triangularis, covers up the entire tonsil at birth is not correct. He dissected a tonsil a month ago, in which the upper crypts were wide open and easily admitted a probe. The triangular plica acts as a pocket to catch bacteria and pass them into the crypts. The presence of bacteria in the crypts was demonstrated by Dr. Jonathan Wright. As to Dr. Kahn's statement that the immunizing theory had been derived from the examination of diseased tonsils, this was not true. Dr. Orendorf examined tonsils that he (Good) had removed, but he did not attempt to build any theory on these examinations.

Dr. Arthur R. Elliott discussed some of the questions in connection with the secondary systemic toxic effects from tonsillar disease. In this he dealt chiefly with such questions as anemia, resulting from hypertrophied tonsils and adenoids, rheumatic conditions occasioned not only by acute follicular tonsillitis, but by more or less latent chronic tonsillar infection, etc.

Dr. O. J. Stein thought that Dr. Elliott's extended observations proved that almost every tissue of the body is capable of being affected by tonsillar disease; therefore, it might be said that all tonsils ought to be removed. These observations have been confirmed by many clinicians. He referred to a case of acute tonsillar disease occurring in a woman 35 years of age, brought on by exposure, which terminated twenty-four hours later in a swelling of the right wrist. This was followed by swelling of the elbow, and then of the shoulder joint. On the second day the knee joints and both wrists were swollen. There was scarcely any rise of temperature, no redness, but the swelling was so marked that the patient was incapacitated. There was tenderness, but no pain, except on motion. It was what might be called a case of polyarticular synovitis. It was questioned whether the tonsillar disease had anything to do with the joint affections. After removal of the tonsils the trouble disappeared entirely. Cases that are likely to be overlooked are those in which there is a slight cough and a rise of temperature simulating tuberculosis. Careful examinations must be made in order to discover suppurating tracts in or about the tonsils. Unless repeated examinations are made in these cases the findings will be negative. Erythema following tonsillar disease is also quite common.

Dr. Freer said that Dr. Elliott has permitted himself a statement of importance which was founded on insufficient evidence. I refer to his assertion that children are anemic because of tonsillar hypertrophy or other tonsillar disease, this anemia being removed by ablation of the tonsil. To be of scientific value, such a statement should be backed by blood counts and quantitative hemoglobin tests, and should not be made without a reference to them. From my clinical observation I regard the doctrine, that children with tonsillar hypertrophy are in consequence anemic, as a text-book tradition rather than a proven fact, for these children have seemed to me to have as good a color as those without tonsillar hypertrophy, nor do they present any of the other clinical signs of anemia. To prove or disprove this doctrine, however, exact blood tests are needed both before and after the operation, and I suggest that such a research would prove a most valuable one for some member of this society.

It is unfortunate that medical literature is inflated by so much that is unsupported by clinical and experimental evidence and is mere plausible theory, announced as demonstrated truth. It requires self-denial for the medical writer to mercilessly elide from his writings the many things which he feels to be true, but has not proven to be so, but the narrow path of exact evidence is the only one to follow.

Dr. Arthur R. Elliott, in closing, commended the scientific spirit displayed by Dr. Freer in requiring proof for every statement made, but time prevented a full discussion of the cases he (Elliott) had presented, although all of his statements were the result of a careful examination in each and every instance. He merely refrained from presenting a mass of detail that would consume more time than was at his disposal.

Dr. Edwin Pynchon read a paper entitled "Sheet of Directions Given the Patient After a Tonsil Operation Including the Treatment of Postoperative Hemor-

rhage,"* in which he discussed in detail all the methods that are ordinarily used for checking postoperative tonsillar hemorrhage.

Dr. Freer:—Dr. Pynchon's paper is a full and therefore valuable compilation of everything that might be tried to check tonsillar hemorrhage. I can think of nothing that Dr. Pynchon has omitted.

I do not agree with him in regard to the frequent gargling and syringing he recommends as after-treatment. I think that such disturbance of the wound, and especially the retching it provokes, would be apt to bring on bleeding, and at a time when the patient is far from help. The mode of operation which I employ, knife incision, causes so little reaction that I have not found after-treatment of any kind needed.

The general measures suggested by Dr. Pynchon for the checking of bleeding seem of especial value, for the most important thing to do in the case of obstinate tonsillar hemorrhage is to lower blood pressure, rather than to fuss with the wound and so displace clots which may be forming in the outlets of the vessels. Therefore, the nauseants, ligation of extremities, upright position and other preventive measures advocated by Dr. Pynchon, and by me in a previous discussion before this society, have my approval.

In regard to the use of tonsil clamps, they are most valuable aids, but apt to be ineffective until the blood pressure is lowered by the bleeding or in other ways.

Dr. Edwin Pynchon, in closing, said that there could be no doubt about the improvement in health after the removal of tonsils. He had yet to see a case where this was not true. He suggested that if Dr. Freer would remove tonsils in their entirety he would get the same results. If he removed tonsils by his (Pynchon's) method, the operation would not only be a bloodless one, but no clots would form, and therefore the gargles and the syringing would not wash away any clots and start hemorrhage afresh. On the contrary, he finds it wise to use gargles with as great frequency as the patient can be persuaded to use them.

Dr. Freer (Reply to closing remarks of Dr. Pynchon):—Dr. Pynchon states that if I removed tonsils completely I would see evidences of disappearance of anemia in children after the operation. I think he misunderstood me, for I said that in my experience there was commonly no physical evidences of anemia in the children I had operated upon, either before or after the operation.

Dr. Pynchon, without personal knowledge of my work, insinuates that I do not completely remove tonsils. I think that those who read my recent articles on tonsillar excision in the *Journal of the American Medical Association* will be convinced that I leave no vestige of diseased tonsils behind after my tonsillectomies.

Dr. Pynchon praises his method of tonsillar ablation, which is known to be cautery dissection, as offering a bloodless operative field. He does not, however, mention the violent and serious postoperative bleedings which occur at the most unwelcome times, days after his operation, in the form of secondary hemorrhage when the cautery sloughs separate, for a seared wound is a treacherous one in regard to bleeding, the vessels when opening in tissues inflamed after a burn, failing to close until the patient is nearly exsanguinated. I have personally treated two of Dr. Pynchon's for him who had most serious secondary tonsillar hemorrhages. In distinction to this, after my knife excision in adults, since I use adrenalin submucously, I have been able to operate in a bloodless field in most cases, and the adrenalin anemia lasts long enough for the vessels to close, so that postoperative hemorrhage is rare and never severe in my experience. In children I have never seen delayed bleeding from tonsils.

Regular Meeting, April 13, 1909.

A regular meeting was held April 13, 1909, with the president, Dr. Henry Gradle, in the chair. Dr. J. C. Beck presented a man who had been severely mutilated in the Kishineff massacre six years ago. The ears presented the worst deformity, and Dr. Beck proposed to perform a cosmetic operation, showing the

* For text of paper see page 179, August number.

patient at this time merely for purposes of comparison. Papers were presented as follows: "Suppuration of Attic of the Middle Ear," by H. Gradle; "The Telephone Theory," by J. G. Wilson, and "Why a Peripheral Tone Analysis Is Necessary to Explain the Phenomena of Tone Perception," by George S. Shambaugh.

SUPPURATION OF THE ATTIC OF THE MIDDLE EAR WITH AN UNUSUAL FORM OF HERNIA OF THE DRUMHEAD AND TRANSIENT LABYRINTHINE INVOLVEMENT.

DR. H. GRADLE.

The following observation presented such unusual features that its report seems to me instructive: Mr. J. C., a healthy man, aged 38 years, had an acute attack four weeks previously, supposed to have been influenza. A left sided earache of one night was followed the next day by discharge, thick from the beginning, which had not diminished in amount although never very copious. There was some pain irregularly which had again increased within the last three days. A colleague who had treated him now proposed mastoid operation. The patient seemed otherwise in good health and with normal temperature. There was variable pain in the ear itself, none behind it, with slight tenderness over the lower part of the mastoid only and scant muco-purulent discharge. The drumhead was hidden by a tumor springing from above and in front and leaving only a narrow chink downward and backward between the meatus wall. The tumor was apparently covered with epithelium and felt solid and slightly mobile to the probe. Hearing fair for whisper and watch heard through the air. In order to prepare for snaring cocain and adrenalin were applied and then injected with a fine needle into the tumor. The excessive tenderness on using the needle led me to defer the use of the snare. After the cocain injection had reduced the sensitiveness to touch I incised the tumor and found it hollow with walls perhaps 3 mm. thick. On catheterizing, the air escaped through the incision without expelling any more fluid. The tumor was evidently a pouch of very much thickened tympanic membrane. Under gauze drainage and instillations of carbolated glycerin the protruding pouch shrank rapidly, and as it receded it became more certain that it was the upper portion of the drumhead. Just before its final disappearance it seemed confined to the flaccid portion, but from its size it did not seem possible to be made up merely of Shrapnell's membrane. As it receded it gradually uncovered the balance of the drumhead, which did not seem abnormal except for its congestion. For a week the pain and discharge diminished rapidly and the mastoid tenderness had practically disappeared. As the pain increased again and the tumor, now reduced to about one-half in size, began to swell again, I made another larger incision into it. As the discharge had shown staphylococci I also injected subcutaneously staphylococcus vaccine. From this time on he had no more pain and the diminution of the discharge and the shrinkage of the tumor proceeded at a constant rate.

Nevertheless the man felt sick the next day and the following night (the tenth day of observation) there occurred labyrinthine involvement. He awoke with involuntary discharge of urine, extreme dizziness and vomiting. The next day I found normal temperature, tongue slightly coated and extreme dizziness from the slightest exertion, ceasing only when absolutely quiet on his back. There was no spontaneous nystagmus. Nothing new was learned on inspecting the ear but the hearing was much reduced. Watch not heard and very loud whisper uncertain close to the ear, but the tuning fork lateralized on the diseased side. The dizziness diminished steadily so that five days later he was able to come to the office, though still dizzy on exertion. The ear showed objectively improvement in every way and the hearing for the voice had also improved. One week after the labyrinthine attack he was able to walk alone though still slightly dizzy. The discharge had ceased. Catheterization showed an intact drumhead, and as the catheter relieved him subjectively it was continued for treatment. The pouch-like protrusion was now limited to the upper posterior part of the drumhead. Steady recovery continued, the dizziness was soon over entirely and within one

month after the onset of the labyrinthine disease the ear was subjectively and objectively normal with practically perfect hearing.

Comments.—The history of four weeks earache without mastoid disease characterizes the disease as inflammation of the attic with scarcely any involvement of the tympanic cavity proper. This is borne out by the history of scant mucopurulent discharge from the beginning without diminution. A smear showed scant staphylococci. The diagnosis of the pedunculated tumor protruding beyond the drumhead and occupying the width of the meatus was at first not clear. The mass was pale red, of somewhat irregular surface, but glistening as if covered with epithelium. The latter appearance made it differ from a polypus. But being mobile to the probe I intended to snare it. Its great sensitiveness, even after the use of cocain, induced me to inject cocain into its base with a hypodermic needle, the slipping in of which suggested the possibility of a pouch of the drumhead. Incision showed it to be a bag with walls about 3 mm. thick, and the subsequent course confirmed the diagnosis of a pouch of enormously thickened Shrapnell's membrane which finally returned to the normal. It was not quite clear whether the hernia was limited to Shrapnell's membrane or extended into the drumhead proper.

Inflammatory pouches are little referred to in literature except by Politzer, who first described them in 1862. They are scarcely mentioned in most textbooks except by Walb.[1] As described by these authors (and pictured in Politzer's Atlas "Beleuchtungsbilder, etc.," and also in Politzer and Bruehls' Atlas of Otology) in the form of small or pedunculated protrusions of Shrapnell's membrane with distinctly purulent contents they are easily recognized and I have met with them in a few instances. But a pouch of the exaggerated dimensions seen in this patient I have never known before from personal experience or literature. The reason why this condition, which had persisted for four weeks, improved so rapidly under my treatment was undoubtedly due to better drainage. Experience in other cases leads me to believe that the subsequently uniform improvement was favored by the staphylococcus vaccination.

The second unusual incident was the involvement of the labyrinth. The sudden occurrence of intense dizziness with initial vomiting and nausea indicated beyond a doubt a disturbance in the semi-circular canals or at least the vestibule. The dizziness was so extreme that the patient scarcely dared to change his position in bed during the first day. An unusual symptom was the involuntary emptying of the bladder at the onset. Yet, notwithstanding their great severity, the labyrinthine symptoms subsided rapidly and on the third day the patient was able to come to the office with assistance. After the lapse of a week he was only dizzy on sudden exertion. A similar clinical condition has been described by Alexander[2] as serous labyrinthitis. He observed it in four patients following in each within twenty-four hours after a radical mastoid operation. As in my case the symptoms arose suddenly and disappeared almost completely within a week. Alexander speaks of spontaneous nystagmus present. This was not observed in my patient. Alexander found the hearing temporarily impaired in one case, not at all in another, while two others had practically been deaf previously. In my patient the hearing, which had been but moderately reduced by the disease of the attic, was very decidedly impaired by the labyrinthine complication. My belief that this was due to involvement of the cochlea is neither supported nor overthrown by the tuning fork test. For, in view of the previous interference with sound conduction, one would still expect the fork to be lateralized on the diseased side as long as the cochlear function was only impaired but not abolished. It must be noted, however, that there were no subjective noises. Alexander considers the labyrinthine lesion as a serous effusion which seems to me probable in view of the sudden onset and rapid gradual decline. It is not clear what caused the complication in the present case. The patient's subjective and objective improvement came to a standstill two days before the dizziness set in. He began to feel

1. Walb: Otitis in Schwartz's Hdb. der Ohrenheilkunde, 1893.
2. Alexander: Arch. f. Ohrenheilkunde, lxxv, 1.

sick and lost appetite but without febrile tendency. The day before the labyrinthine complication I reopened the incision in the protruded membrane. The improved drainage now permitted again a steady uninterrupted recovery from the attic disease, but perhaps it came too late to prevent the labyrinthine effusion.

DISCUSSION.

Dr. George E. Shambaugh saw the patient and said that one of the interesting features was the protrusion of Shrapnell's membrane. The confinement of the suppuration in the attic is readily accounted for by the fan-shaped arrangement of the ligaments about the neck of the malleus. An examination of these ligaments with the reduplication of mucous membrane extending from the ligaments and the ossicles to the surrounding walls sometimes shows the attic or recessus epitympanicus shut off from the tympanic cavity proper, with the exception of a small opening, which in the case of inflammation could be readily swollen shut. The labyrinthine involvement in this case is of special interest. The condition was evidently not an extension of suppuration into the chambers of the inner ear, such as sometimes occurs in suppurative otitis media. An involvement of the inner ear other than by an invasion of pus is not so uncommon in acute suppurative otitis media. In these cases the trouble is usually limited to the cochlea, and is manifested by a more or less extensive defect for the higher notes of the Galton whistle. In many of these cases this defect in hearing disappears completely, while in others it remains permanent. Since cases of this kind rarely come to autopsy, it will be difficult to determine positively what the pathologic changes are in the labyrinth. Several possible conditions suggest themselves. One is that there is a serous exudate into the structure of the inner ear, not necessarily an increase, as is sometimes supposed, of the fluids in the labyrinthine chambers. Another is that a hyperemia is occasioned, involving the lower end of the basal coil, thus producing a defect for the highest tones. It would also seem probable that an inflammatory round-celled infiltration could occur in the structure of the cochlea, producing the disturbance in function.

Dr. Harry Kahn cited the case of a woman, aged 56 years, who, three weeks after an attack of influenza, developed an otitis media on the left side. A paracentesis was done, and on the next day there developed a slight edema of the mastoid tip. This became worse, so that a second paracentesis had to be done. On the fourth day she developed labyrinthine symptoms, extreme nausea and vomiting, with dizziness, and had nystagmus that was very prominent at first toward the affected ear for about twelve hours, with a sensation as of falling forward. After about twenty-four hours the nystagmus came on when she looked toward the opposite side, with dizziness and vomiting, but becoming gradually less as she lay on the right side. These symptoms lasted four days, and then disappeared. It is now three weeks since these symptoms developed, but whenever she makes the least movement there is dizziness and nystagmus. During the presence of the initial symptoms hearing was reduced; there was a short positive Rinné; the Edelmann-Galton whistle was reduced to 5½. This continued for two weeks, when she gradually became better, and now she hears well. Dr. Pierce, who saw this case, thought that these cases developed usually in older people, and that there was some connection between the development of the labyrinthine symptoms and middle life or old age, when arteriosclerosis or some other change sets in.

Dr. J. Holinger:—About a year ago I presented before this society a girl of 18 who had all the symptoms described by the Doctor, namely, deafness, nausea, dizziness, etc.; in one word, she had a labyrinthitis in connection with an acute otitis media: a panotitis. Of course, she had no arteriosclerosis, so that the labyrinthine complication probably has nothing to do with age nor with arteriosclerosis, but is very likely due to a defect in the wall of the labyrinth. In the case of Dr. Gradle, why should we not consider the possibility of a closed-up Prussak's space? I do not think that it would be too far-fetched to think that the fluid which gathered there in connection with an acute otitis might exert pressure against the body of the anvil, which, transmitted through its long process

to the stirrup, might produce labyrinth symptoms. A second possibility is that of an acute serous labyrinthitis.

Dr. A. H. Andrews has seen two cases of circumscribed bulging of the membrana tympani, one being in the membrana tensa and the other in Shrapnell's membrane. They were caused by acute otitis media with serous effusion. Neither perforated, and after using phenol-glycerin for its osmotic effects, resolution occurred. After the fluid in the middle ear disappeared the bulging portion of the membrana tensa remained flaccid, so that by varying the air pressure with Seigel's otoscope this portion of the membrane could be made to move inward and outward from the general line of the membrane. The ear was examined on several successive days, and the membrane was seen to graduallly regain its normal tone. He does not remember the hearing records, as the patients were seen several years ago. He thinks there is no question but that pressure in the middle ear may cause circumscribed bulging of the membrane, and that this may account for Dr. Gradle's case, but it could not account for the extreme thickness of the sac wall.

PHYSIOLOGY OF THE COCHLEA.

Professor A. J. Carlson said that doubtless many invertebrates have sound perception, although not possessed of a structure strictly comparable to the ear of vertebrates. Insects have auditory hairs and membranes. The evolution in the ear of vertebrates occurs only in the cochlea, not in the semicircular canals, sacculus or utriculus. Fishes, however, hear without a cochlea, but from the fishes upward the cochlea is present, and it shows practically the same structure throughout. The elements lacking in some groups are not essential for sound perception. The rods of Corti are lacking in some animals, the number of hair cells are variable and the tectorial membrane appears to vary in structure. The greatest striking difference is in the length of the cochlea, not in histologic details. It is shortest in frogs, while in human species it reaches its highest development. The cochlea is the organ for sound perception, although the sacculus and utriculus cannot be excluded. The theories developed to explain the mechanism of the cochlea fall into two groups, those of central and those of peripheral analysis. Peripheral theories depend on resonance and "sound patterns," etc. The Hunt theory is the compression theory, the waves meeting at different points in the cochlea, according to the length of the sound waves. Meyer's theory takes into consideration the distance the parilymph waves travel in the cochlea. Ewald claims that the pitch is determined by the sound patterns produced by the hair cells coming in contact with the tectorial membrane. The resonance theory of Helmholtz is worked out in greatest detail and quite generally adopted. The telephone theory of Rutherford appears to be incompatible with what is known of the physiology of conduction of nervous tissues.

THE TELEPHONE THEORY.

JOHN GORDON WILSON, M. D.

In the time at my disposal to-night it is impossible to discuss fully the telephone theory. I will, therefore, limit myself to a brief review of the main reasons why the supporters of this hypothesis prefer it to the more generally accepted piano or resonance theory. In the present state of our knowledge with regard to tone perception one is justified in supporting that hypothesis which best explains the known facts in regard to tone perception; which is least in disagreement with the recognized facts of anatomy, physiology and physics, and which at the same time gives the best basis for progressive investigation. This is what I claim for the telephone theory. Under the name telephone theory are grouped various shades of hypotheses in regard to tone perception, all of which unite in rejecting the Helmholtz piano or resonance theory as unsatisfactory and all of which agree in these two essentials, viz., that the membrana basilaris or the membrana tectoria vibrates as a whole, and that while a certain amount of analysis is peripheral, the ultimate analysis is in the cerebrum.

The telephone theory has the support of some of the best physiologists, for instance, Ewald,[1] who has done more than any physiologist to elucidate the physiology of the ear; of Waller,[2] one of the most distinguished English physiologists. It has the support of some of the best neurologists, for instance, Mott, one of the greatest living neuro-pathologists, and Hardesty, one of the best neurologists in this country. It is agreed that the auditory impulses are conveyed in the acoustic nerve by means of the hair cells of the organ of Corti, probably through the agency of the hairs. That these hairs are not themselves capable of producing suitable vibrations would appear from the fact that their length and arrangement seems to be such as to preclude their acting as suitable vibrating structures. Such being the case, we have to seek for some mechanism which will produce suitable vibration of the nerve endings which are so closely attached to these hair cells and so offer a reasonable explanation of tone perception. The telephone theory received its first great support if not its birth from the work of my old professor of physiology, Rutherford. Since that time it has lost many of its non-essentials and still to-day influences the investigations of some of our best physiologists. In order to get a clear idea of what the telephone theory implies it seems best to give the conception of it presented by two of its most prominent exponents. Ewald[1] states it thus: A tone sets the whole basilar membrane into vibration and is analyzed into a series of waves. The totality of these waves (the sound-picture, Schall-bild) produces in the brain the tone perception. Each tone corresponds to a characteristic sound-picture. Waller's[2] interpretation of it is very similar. The basilar membrane vibrates in its entire area to all sounds though more in some parts than in others, giving what we may designate as acoustic pressure patterns between the membrana tectoria and the subjacent field of hair-cells. So the varying combinations of sound give varying pressure-patterns comparable to the varying retinal images of external objects. Hardesty's[3] conception corresponds to these applied, however, not to the basilar membrane but to the tectorial membrane.

The main reasons I would present to you for rejecting the resonance theory as applied to the basilar membrane may be briefly put as follows:

1. It is doubtful if this membrane is composed at all of independent fibers. It appears to partake more of the nature of a feltwork of interwoven fibers comparable to what appears in a thin flat tendon.

2. The radial fibers which do appear are so weighted that they cannot act as resonators.

3. The resonant theory demands that the cells of the organ of Corti must be capable of moving separately, but it would appear that these cells are intertwined and interwedged so firmly as to be impossible of so acting.

4. Physiologically no resonance theory is capable of explaining the phenomenon of tone-perception without suppositions in general physics which have not appealed to some of our best physiologists and physicists. The difficulty in regard to beats has been explained away by assuming that each tone stimulates not one but several neighboring radial fibers, assuming these fibers to be capable of acting as resonators; but no adequate explanation has been offered for what is known as combination tones. The supposition that these combination tones are due to some formation in the tympanic membrane or the incus-malleus joint is not regarded by many physiologists as satisfactory.

The up-building of a theory of resonance with the basilar membrane as the resonating structure has proved so unsatisfactory that the attempt has been made to replace it by the tectorial membrane. To me the objections to the tectorial membrane are even more serious than those which can be applied to the basilar membrane. Passing over the physiological arguments that can be raised against any resonance theory, we have the following fatal objections:

---

1. Ewald: Nagel's Handbuch der Physiologie des Menschen. Braunschweig, 1905, Bd. 3, p. 571.
2. Waller: Halliburton's Handbook of Physiology. Philadelphia, 1904, p. 749.
3. Hardesty: The American Journal of Anatomy, 1908-9, viii, 109.

1. It is obvious that in order to discuss the physiology of a body we must know its anatomic structure. So far anatomists have not been able to offer such information in regard to the tectorial membrane, but differ widely in regard to its formation and its attachments. It is a structure of such supreme delicacy that it offers great barriers to ordinary methods of study; methods of fixation at present at our disposal appear worse than useless.

2 Physicists declare that even granting those disputed characters which the supporters of this phase of the resonator theory claim to be present in the tectorial membrane, this membrane does not appear capable of acting as a resonator and is not comparable to any resonator known to physics.

It will be noted that these objections to the tectorial membrane are largely based on a want of definite anatomic knowledge in regard to its structure. Such knowledge is gradually increasing, and to this end the work of Shambaugh has been that of a pioneer. Further investigation may therefore be looked for to confirm or refute these objections; but at present we must note their existence. The objections which have been made to the basilar membrane as a resonating structure do not apply to the basilar membrane as a vibrating structure. Of the above anatomic objections which I believe to carry the most weight against the resonance theory, not one can be successfully urged against the basilar membrane as a vibrating structure. In short, it is acknowledged to be a structure capable of vibrating. The principle argument that has beeen urged against the telephone theory is that it leaves the exceedingly elaborate structure of the organ of Corti out of account.[4] It has always seemed to me that this objection loses much of its force when one considers that the hypotheses of Ewald and of Waller demand such a peripheral mechanism in order to translate the complex sound waves into corresponding nerve impulses. The physical properties of sound are so totally different from what the physico-chemical properties of nerve impulses appear to be that in order to get the complexities of the sound waves adequately interpreted by the corresponding nerve impulses an intermediary mechanism of considerable complexity must be employed. If the relatively simple sensations of pressure or taste require an elaborate peripheral mechanism to translate the physical or chemical stimulus to a corresponding nerve impulse how much more elaborate must be the mechanism which translates the complex wave motions of an orchestra into corresponding nerve impulses. Accordingly the statement that the telephone theory offers no explanation of the organ of Corti seems based on an inadequate conception of the full significance of the hypothesis. At this point one must clearly recognize that the assigning of a degree of peripheral analysis to a vibrating structure is a totally different thing from assuming that the vibrating structure is acting in a manner comparable to a resonator.

In regard to the ultimate analysis of sound the evidence seems to me to point to its being central. It is a matter of every-day experience that tone perception varies greatly in individuals and is largely a matter of education and imitation. This does not appear to be easily explained if we assume a constant peripheral non-nervous mechanism for the elaborate differentiation of sound which the resonance theory presupposes. Involved in this question is the difficult and as yet undecided physiological problem of the specificity of nerves, that is, that a nerve fiber only transmits impulses producing one kind of effect. This is a question of vital importance to both the resonance theory and the telephone theory. It appears to me that the modern trend of physiology is towards the belief that the nerve fiber is capable of transmitting not one but several varieties of nerve impulses. Thus in taste, for example, it would be assumed that there is not one nerve for sweet and another for bitter but that according to the kind of peripheral irritation at the taste bud so is the central interpretation which is produced through the medium of the nerve.[5] To go one step further, sugar produces sensations of sweetness, salt of saltness, but a mixture of sugar and salt produces a

4. McKendrick: Schafer's Text-Book of Physiology. Edinburgh, 1900, II, 1102.
5. Nagel: Handbuch der Physiologie des Menschen. Braunschweig, 1905, Bd. 3, p. 641.

sensation totally different from either sweetness or salt.[6] Similar interpretations are also applied to the other senses. I do not claim that with our present knowledge the telephone hypothesis explains everything physiologic and pathologic, but I do claim that it offers a sounder basis from which to attack the complex difficulties of the physiology and the pathology of the auditory nerve than does the resonance theory.

WHY A PERIPHERAL TONE ANALYSIS IS NECESSARY TO EXPLAIN THE PHENOMENA OF TONE PERCEPTION.

GEORGE E. SHAMBAUGH, M.D.

At a previous meeting of this society, Feb. 9, 1909, I discussed briefly the conclusions reached in my work on the physiology of the cochlea. I pointed out that the stimulation of the nerve endings of the acoustic nerve in the cochlea is undoubtedly brought about by an interaction between the projecting hairs of the hair cells, and the overhanging membrana tectoria. At this time I discussed some of the reasons for the conclusion that the membrana tectoria and not the membrana basilaris is the active agent which brings about this interaction by responding to the impulses of sound waves passing through the cochlea. I also explained at that time that our conclusions as to the probable mode of response which the membrana tectoria gives to the various tone impulses must be determined largely by ascertaining what mode of response will best explain the phenomena associated with tone perception, since the mechanism is too delicate and too complex to permit of physical demonstration. In this respect the ear is exactly like the other special sense organs. The final explanation of the mechanism of all the special sense organs is in the nature of an hypothesis that eludes actual demonstration. In discussing the probable action of the membrana tectoria, I pointed out that three possible modes of response suggest themselves. By the one the whole of the membrana tectoria would be thrown into motion by every tone, thus bringing about a stimulation of all the nerve endings in the cochlea for every tone. By the second mode the highest tones would throw into vibration the tiny tectorial membrane near the beginning of the basal coil, while each succeeding tone lower in the scale would cause to vibrate a larger and larger area of the tectorial membrane until the lowest tones would throw this entire membrane into vibration. By the third mode of response different segments of the tectorial membrane would be thrown into vibration, each for a tone of a different pitch.

In my discussion at that time I made the statement that the first mode of response whereby the whole of the membrana tectoria would vibrate to the impulses of every tone, thus stimulating all the hair cells, was but a restatement of the telephone theory, an untenable hypothesis that had long since been discarded by physiologists. One of the members, in discussing my paper, took exception to my statement that the telephone theory was untenable, and asserted that he was an advocate of this theory, but gave no arguments supporting his position. When it was sugested that we devote part of the time of this meeting to a discussion of the telephone theory, I very willingly consented to present some of the arguments why the telephone theory is untenable, and why the opposite hypothesis, that of a peripheral analysis, is indispensable in accounting for the phenomena of tone perception. I must admit, however, in taking up this discussion, that I have felt a good deal as one would when asked to defend the theory that the earth revolves around the sun rather than that the sun makes revolutions about the earth. The real arguments appear to be all on the one side, yet to attempt to prove to another in a few minutes' discussion that the latter hypothesis is untenable might not necessarily appear conclusive.

The most conspicuous phenomenon to be accounted for in connection with tone perception is that of subjective tone analysis. This is the faculty which the ear possesses of analysing into its component elements complex tone impulses. There are two theories as to where this tone analysis is accomplished. According to one, it is accomplished by the peripheral apparatus in the cochlea. According to

6. Nagel: Loc. cit., p. 643.

the other theory, this analysis is a function of the cerebral cortex. These two propositions may be stated graphically as follows: Supposing the tones, a, b and c, are sounded together, the complex impulse arising is analyzed subjectively, so that we are able to recognize the separate tones, a, b and c. According to the theory of peripheral analysis, when this complex impulse, which we may designate by X, reaches the cochlea, it is analyzed so that separate groups of nerve fibers are stimulated for each of the three tones, a, b and c. When the three separate sets of nerve impulses arising in this way, which we may designate by a′, b′ and c′, reach the center in the cortex, they are perceived as the tones a, b and c.

According to the hypothesis of a central cortical analysis all of the nerve endings in the cochlea are stimulated by the complex tone impulse X, thus causing the nerve trunk to act as a unit and the resulting nerve impulse conducted by the nerve trunk, which we may designate as X′, is analyzed in the cortical center, so that we get the perception of the tones a, b and c.

The theory of a peripheral tone analysis is inseparably connected with the Helmholtz resonator theory of tone perception. Long before the time of Helmholtz, however, the idea had found expression that the perception of the various tones takes place in separate parts of the cochlea tube, the higher tones in the basal coil, the lower tones near the apex of the cochlea. It was Helmholtz, however, who gave this theory its greatest scientific support, and especially emphasized how such a selective action in the cochlea was possible, on the principle of physical resonance. This theory of a peripheral tone analysis is not only the fundamental principle in the resonator theory of Helmholtz, but it is the fundamental conception in all the important theories of tone perception that have been advanced since the time of Helmholtz.

From purely anatomical reasons this peripheral specialization of function in the cochlea, the localization for the perception of the various tones in separate parts of the cochlea, seems a priori to be probable for the following reasons: In the first place, the long rows of hair cells running from one end of the cochlea to the other constitute a mechanism admirably suited to the requirements of such a theory. In the second place, the elaborate mechanism found in the cochlea makes it highly probable that we have located here a peripheral tone analysis. Moreover, such a peripheral specialization of function, as has been pointed out by McKendrick, brings the organ of hearing in accord with the other special senses, as taste, smell and sight. Furthermore, to quote from McKendrick (Schaeffer's Physiology, page 1192), "The most obvious objection to any theory which dispenses with peripheral analysis is that it leaves the exceedingly elaborate structure of the organ of Corti, and, indeed, of the cochlea as a whole out of account, or, to put the matter in another light, it assigns to that organ a comparatively simple function (like that of a vibrating membrane), and one which could be performed by a more simple structure. Furthermore, the holder of such a theory, while recognizing the analytic powers we undoubtedly possess, must refer these powers to the cortex cerebri and practically admit that the problem cannot be solved."

The theory of a central cortical analysis was first advanced by Rutherford, and was called the "telephone theory" of tone perception. It was based upon the assumed existence of an analogy between the phenomena of hearing and that of an ordinary telephone device. This analogy, however, is not a true one, for while the telephone is capable of taking up a complex sound impulse, and of conveying it to a distant end piece, where it is again reproduced unaltered, the telephone has no power of analysis. It is the same complex impulse which entered the receiver that is reproduced in the distant end piece. The analysis which we perceive when listening at the telephone, is, of course, accomplished in the ear itself. The proposition can be graphically represented as follows: The complex impulse arising from the tones, a, b and c, which we represented by X, impinges on the telephone receiver and is transferred as X′ to the distant end piece, where it is again reproduced, not as the tones a, b and c, but as the complex X. Compare this with what takes place in the phenomena of hearing. The failure of the

analogy is at once apparent. The actual tone analysis is, of course, accomplished after X enters the organ of hearing. It is immaterial whether this reaches the ear before or after it has passed through the telephone.

The statement has just been made that Ewald is a supporter of the telephone theory. Ewald's conclusion was based on observations he had made of the vibrations of a taut rubber membrane in an interesting ear model he had constructed. Ewald, proceeding from the hypothesis, which has been generally accepted since the work of Helmholtz on tone perception, that the membrana basilaris is the structure in the cochlea which is thrown into vibration by the impulse of sound waves, constructed an ear model in which a thin rubber membrane, varying in width from one end of the cochlea to the other, took the place of the membrana basilaris. On conducting sound waves into this model, Ewald was able to observe and to photograph movements of this taut rubber membrana basilaris. In these experiments Ewald found that, instead of vibrating in separate segments, as the membrana basilaris should do, according to the Helmholtz theory, this rubber membrane, as a whole, was thrown into wave-like motions by every tone. Ewald concluded, on the basis of these experiments, that the membrana basilaris in the cochlea also vibrated as a whole in response to every tone, and that the "sound pictures" thus produced were interpreted in the cortex, where, of course, the final step in perception takes place. This taut rubber membrane in Ewald's ear model bears no more resemblance to the complicated structure of the membrana basilaris than does a sheet to the strings of a piano forte, and any demonstration of the possible action of this rubber membrane cannot be accepted as a demonstration of the probable action of the membrana basilaris. As a matter of fact, however, Ewald's theory of tone perception is as much a theory of peripheral analysis as is the resonator theory of Helmholtz. Ewald states emphatically over and over again that the idea that the nerve trunk acts as a whole in the conduction of sound impulses is untenable, and that it is absolutely necessary to have different groups of fibers in the nerve stimulated for the different tones. This peripheral analysis is accomplished in the Ewald theory by assuming that only those hair cells in the organ of Corti are stimulated which occupy the crests of the wave-like undulations of the basilar membrane. The different characters of the wave-like undulations produced by the tones of different pitch result in the stimulation of different groups of fibers for each tone in the scale.

The theory of a peripheral tone analysis, for reasons given above, seems a priori to be the probable one, whereas the telephone theory, the hypothesis of a central analysis, is entirely without scientific support. There are other phenomena beside that of tone analysis that must be accounted for in a theory of tone perception. These are, in the first place, the so-called secondary phenomena of tone perception, and, in the second place, the occurrence of diplacousis, that is, the perception of a tone of a different pitch in the affected ear from that heard in the normal hearing ear; also the occurrence of certain peculiar types of subjective noises. Discussions of the occurrence of the secondary phenomena of tone perception, such as beats, difference tones, summation tones, intermittent tones, consonance, dissonance, etc., etc., has occupied a conspicuous place in the literature on the theory of tone perception. The problems are hardly suited for discussion here. The conclusions reached, however, are in accord with the theory of peripheral analysis. In fact, in the resonator theory of Helmholtz is found not only a natural explanation of most of these secondary phenomena, but, indeed, their only plausible scientific explanation. The theory of central analysis, the telephone theory, has no satisfactory explanation for the occurrence of these secondary phenomena.

Finally the occurrence of certain peculiar symptoms in connection with pathological changes in the labyrinth, such as tone islands, diplacousis, etc., can be accounted for plausibly only on the hypothesis of a peripheral tone analysis in the cochlea. For example, the phenomenon of tone islands and of circumscribed defects in the tone scale, a condition which is known to occur only in connection with diseases involving the cochlea, is readily explained by the destruction of circumscribed areas of the organ of Corti, provided we accept the theory of peripheral tone analysis. Whereas, if we accept the

theory that all of the hair cells in the cochlea are stimulated by every tone, and that tone analysis is accomplished in the cortex, there appears no plausible explanation for the occurrence of this well known phenomenon. The same holds true regarding the occurrence of diplacousis, where a tone is heard falsely in the affected ear. This is readily accounted for in the theory of a peripheral analysis by assuming a circumscribed alteration in the vibrating structure in the cochlea which caused a part of this structure to respond to a tone of a different pitch from when in its normal condition. On the other hand, with the telephone theory referring the analysis to the cortex, there appears no explanation for the occurrence of this phenomena.

The peculiar types of tinnitus aurium that occur in connection with diseases of the cochlea, for example, the development of tinnitus of a certain pitch, as the result of an injury to the ear caused by a schrill whistle of the same pitch, speaks for a peripheral rather than a central analysis. Again, the finding of circumscribed areas of degeneration in the organ of Corti in animals previously subjected to shrill tones of a certain pitch, is in itself an actual demonstration of the existence of peripheral rather than of central analysis. The following conclusions seem quite clear: First, that the telephone theory of central tone analysis is not only untenable but is lacking in scientific support; second, that the theory of peripheral tone analysis in the cochlea is indispensable for the following reasons: 1. The elaboration of structures in the cochlea all point to the conclusion that a peripheral specialization, that is, a peripheral tone analysis, is located here.

2. A comparative physiological study of special sense organs points toward a peripheral specialization of function in all of the special sense organs. This is as true of the ear as it is of the other special senses.

3. The secondary phenomena of tone perception are plausibly accounted for only on the hypothesis of a peripheral tone analysis in the cochlea.

4. The peculiarities in tone perception that occur in connection with pathological changes in the labyrinth, such as tone islands, or defects in the midst of the tone scale, and the phenomena of displacousis, as well as the occurrence of peculiar types of tinnitus aurium, argue in favor of a peripheral rather than a central tone analysis.

5. The production of circumscribed areas of degeneration in the organ of Corti as the result of exposure to long continued overstimulation by intense tones of a certain pitch amounts to a practical demonstration of the existence of peripheral analysis.

DISCUSSION ON THE PAPERS OF DRS. WILSON AND SHAMBAUGH.

Dr. A. H. Andrews, referring to the question of whether fishes hear, called attention to the fact that two stones struck together in the water produce an exceedingly unpleasant sensation in the ears of one who is under water. It has been shown that fishes can be driven toward a net by this method. It would seem, therefore, that fishes must be susceptible to the same sound impressions as affect the ears of individuals under water. Dr. Shambaugh spoke of the subjective noises being produced by a long continued shrill whistle, and that they were always of the same pitch as the whistle producing them. Dr. Andrews does not know how these subjective noises are produced any more than he understands the physiologic process of thought. It is known that one can think so long and so intently upon a given subject that he cannot think of anything else. This may have some relation to the tinnitus which is caused by the long continued intense sound mentioned by Dr. Shambaugh.

Dr. J. Holinger:—My views as to sound perception are pretty well known. The presentation to-night by Dr. Wilson of his telephone theory is new to me. I would ask Dr. Wilson how he explains the following finding: A man stands beside a locomotive while its steam whistle emits a loud shriek. The man remains deaf for the rest of his life for any tone of the pitch of that whistle, but suffers from an uninterrupted subjective noise of that pitch. At death, degeneration of certain parts of the cochlea are found and ascending degeneration of certain parts of the acoustic nerve. Further similarly conclusive arguments are gathered now at

the laboratory from animals. If, as Dr. Wilson explains, with each sound the whole of the basilar membrane vibrates, why should a circumscribed degeneration of the nervous part affect the hearing or perception of one certain set of tones and not others? Furthermore, the problems of the middle ear are not liable to support Dr. Wilson's standpoint.

Dr. Carlson called attention to the fact that no matter what theory is adopted, that of central or peripheral analysis, it must not be forgotten that the ultimate analysis in both is central, but in order to have central differentiation there must be differentiation in the impulses that go to the center, because, if they were identical, there could not be any central differentiation. A tuning fork vibrating one hundred times will send its nervous impulses along different sets of nerve fibers from those which conduct the vibrations of a tuning fork vibrating two hundred times. Rutherford stated that the two impulses are conducted by the same fibers and differ only in rate, and that a central differentiation is made on this basis. That is, central analysis or the telephone theory. Ewald's theory is based on peripheral analysis. Rutherford assumes that the highest pitch of the Galton whistle gives, say 40,000 nervous impulses per second. Comparative physiology of nerve fibers and cells shows that it is highly improbable that they can conduct at that rate. It is possible, but not probable, that the auditory nerve can conduct impulses at the rate of ten or thirty thousand per second, but, as conceived by Rutherford, it cannot conduct impulses corresponding to a number of tones at the same time, as the facts of experience demand. It ought to be possible to connect the auditory nerve with a capillary electrometer and measure the number of impulses generated by different tones. The difficulty in doing experimental work is that one can rarely injure one part of the hearing apparatus without injuring the whole apparatus and the uncertainty in determining auditory defect in animals. Therefore, the final answer must come from the clinician.

Dr. J. Gordon Wilson stated that in this discussion the fundamental differences between the resonance theory and the telephone theory did not seem to be clearly recognized and so discussion of their relative merits lost much of its force. What are the essential points in the telephone theory as enunciated by Ewald or by Waller? Namely, that the basilar membrane vibrates as a whole to the sound waves which there produce distinct peripheral impulses in turn communicated through the hair cells to the acoustic nerve; further, that the ultimate analysis in the tone perception is central. It will be noted that the telephone theory acknowledges distinct peripheral impulses in the cochlea, but this is a totally different thing from peripheral analysis due to resonators, demanded by the Helmholtz theory. In regard to tone islands and gaps, no less an authority than Nagel has stated that these are capable of being simply explained by the Ewald hypothesis. The telephone theory does not claim at the present moment to explain everything, but it offers a good working hypothesis along the lines of which progress may be made and it is not open to those fundamental anatomical and physiological objections which can be urged against any resonance theory.

Dr. George E. Shambaugh (closing discussion) stated that he had listened closely to the remarks by Dr. Wilson purporting to be arguments in support of the telephone theory, and had failed to hear a single scientific argument in support of this hypothesis. He is therefore obliged to repeat the statement made at a previous meeting that not only is the telephone theory untenable, but that it is without supporters among physiologists to-day. The assumption that Ewald is a supporter of the telephone theory is, of course, a mistake, since Ewald's theory is as much a theory of peripheral analysis as is the resonator theory of Helmholtz. Occasionally some one may persuade himself, as Dr. Wilson has done, that he is a supporter of the telephone theory, but as soon as he attempts to give his reasons he at once chases himself up a tree. The chief argument Dr. Wilson has offered to support his view is that he conceives of a telephone theory modified from the original. But when he attempted to point out wherein this modification lies he begins at once to advocate, as Dr. Carlson has pointed out, the principle of peripheral analysis, just the opposite hypothesis from the telephone theory; the theory of central analysis.

Another good example of the illogical position assumed by certain would-be supporters of the telephone theory is the case of Professor Hardesty, of the University of California, referred to by Dr. Wilson. About a year after my first paper on the physiology of the cochlea appeared, Professor Hardesty published a treatise on the same subject, in which he expressed practically the same conclusions which I had reached, namely, that we must look to the membrana tectoria rather than the basilar membrane as the active agent in bringing about a stimulation of the hair cells in the organ of Corti by responding to the impulses of sound waves in the endolymph. In his paper he asserts over and over again that his conclusion as to the probable action of the membrana tectoria in responding to the impulses of the various tones differs from the conclusion I had reached, in that he advocates a modified telephone theory. His modification of the telephone theory, however, is nothing short of a substitution of the principle of peripheral analysis for that of central analysis which constitutes the fundamental conception of the telephone theory. That Professor Hardesty has accepted in his paper the conclusions I had reached as regards the necessity for peripheral analysis, is brought out very clearly where he discusses the possible cause for the phenomenon of tone islands and defects in the tone scale. These may be produced, he contends, by the occurrence of circumscribed calcareous deposits in the membrana tectoria. Now it is quite clear that if the interference with the motion of a part of the tectorial membrane, such as would be occasioned by a circumscribed chalk deposit, will produce a defect in the tone scale, then the converse is also true, namely, that the vibration of this particular part of the tectorial membrane will result in the perception of the part of the tone scale included in this defect. This is as concise a statement of the principle of peripheral analysis as one could wish. In the telephone theory every hair cell in the cochlea will be stimulated for every tone. It is clear, I contend, that from whatever point of view the problem is approached, anatomical, physiological or clinical, there is no escape from the conclusion that the principle of peripheral analysis is indispensable in the theory of tone perception.

CHICAGO OPHTHALMOLOGICAL SOCIETY.

Meeting of Feb. 8, 1909.

A regular meeting was held Feb. 8, 1909, with the president, Dr. Frank Allport, in the chair.

ACUTE CHOROIDITIS (?)

Dr. G. J. Schneider, Elgin, Ill., exhibited a boy, aged 17, who noticed, six months ago, that he could not play ball because he never was sure of the position of the ball. Examination showed cornea, sclera, iris and reflexes were normal. Vision, left eye equals 4/200; right eye, 20/40. With the ophthalmoscope the macula of the left eye was seen to be enlarged to one-half the size of a silver dime, circular, with small dark radiating striæ; right eye, the ground was similar to that in the left eye except that the macula was smaller and the striæ were not so marked. Physical examination negative; personal and family history negative except that one brother has strabismus.

Dr. Dodd thought this case to be one of acute choroiditis due to a severe chilling. He has seen several of these cases in which he had obtained a definite history of chilling.

Dr. Snydacker that it is a retinal lesion rather than a choroidal lesion.

NEURORETINITIS DIABETICA (?)

Dr. Major H. Worthington exhibited a man, aged 51, who about two months ago noticed that he could not distinguish objects with the left eye. For the past five or six years he has suffered much from thirst and has had excessive urination. Vision, right eye, 20/20; left eye, 9/200. In the eye there is every appearance of albuminuric retinitis, although repeated examinations have shown that there is no albumin in the urine, but from 0.8 to 1.5 per cent. of sugar; specific gravity 1022. The mother died of pulmonary tuberculosis, and the father from a

carbuncle of the cheek. Patient had typhoid fever thirty years ago. Denies venereal history.

Dr. Casey Wood was inclined to regard this as a case of thrombosis of the lateral vein, showing the picture of changes in the vein.

PUNCTATE SUPERFICIAL KERATITIS.

Dr. George F. Suker exhibited this patient. He was treated for four or five weeks on the expectant plan, and by exclusion he discovered that the middle turbinal was cystic at its posterior end, involving the anterior ethmoidal cells. Vision was 22/100—; correction, + 2, combined with —3, axis 25. Vision did not improve under treatment, and ten days ago the ethmoid cells were removed, together with the middle turbinate. Vision, with correction, now is 20/20. The spots in the cornea are now very minute. They never were confluent. There was never any evidence of inflammatory reaction. The other eye was never involved in the process.

Dr. Thomas Faith thought that unless the lesion in the cornea had been very much worse than it now seemed to be, there must have been something more than a corneal trouble. There was some evidence now of corneal trouble, but hardly enough to have reduced vision to 20/100.

Dr. Suker said that these spots were visible to the naked eye, and now they can scarcely be seen with Berger's loop and condenser.

CILIA IN ANTERIOR CHAMBER.

Dr. Mortimer Frank showed a patient, 21 years old, who, when three years of age, was accidentally struck in the eye with the point of a pair of scissors. One of the cilia of the eyelid evidently had been driven into the eye, and has been imbedded there ever since, to the temporal side of the limbus, midway between the posterior surface of the iris. It has never produced any irritation.

Dr. C. A. Leenheer saw a patient a year and half ago who was working with a drill which broke and produced a perforation injury of the cornea. The metal carried in one of cilia, which imbedded itself in the lens. The lens is almost completely absorbed. One end of the cilia was on top of the iris. With a plus lens the patient has about 20/100 vision in that eye.

Dr. H. B. Young some time ago saw a case of cilia in the eye of twenty years' standing, and although the lens has been absorbed, there were no symptoms.

DOUBLE TARSECTOMY.

Dr. Mortimer Frank exhibited a young man on whom he did a double tarsectomy for trachoma, with complete pannus of both eyes, seventeen months ago. The result was entirely satisfactory.

A CASE OF TRAUMATIC OPTIC ATROPHY.

Dr. A. H. Andrews:—F. K., aged 27, a machinist, was injured Dec. 27, 1908, by falling backward and striking his head against a steam pipe. The patient thinks he was unconscious for a few minutes only, vomiting afterward, but walked to his home a few blocks away. The next morning he discovered that he was totally blind in the right eye. I examined this patient first on December 31. There was an abrasion on the back of the head on the right side, but no depression of the skull. The fundus of the right eye was examined under a mydriatic. The retina was white and thrown into folds, the upper temporal and lower nasal being most prominent. The difference between the depressions and elevations seemed to be 3 or 4 D. Both the veins and arteries were smaller than normal and the margin of the disc could not be distinguished. The patient was placed in the hospital for two weeks, where hot applications and massage were administered. The folds in the retina gradually smoothed out, and the vessels, especially the veins, have gradually assumed their present condition. As now seen the veins can hardly be distinguished in places, while in other places there seems to be a small amount of blood in them. The arteries are more uniform in size but much smaller than normal. A number of granulation areas can be seen. Along all the larger blood vessels can be seen perivascular degeneration. The principal point

of interest in the case is the rapid fundus changes evidently caused by interference with the circulation, due to a distant injury.

Dr. Thomas Faith thought that Dr. Andrews' case was one of fracture of the orbit, which would account for the rapid changes taking place.

Dr. Andrews stated that the rapidity of the vascular changes was most interesting. Ten days ago the veins were full, although not distended. Three days later they were not quite so full, and three days ago they were empty. At the present time there is practically no blood in the veins. The perivascular degeneration has been progressive, as the veins and arteries shrunk. There has been no pain or other disturbance, other than that the patient is totally blind in that eye.

INFLAMMATORY (TUBERCULOUS) SWELLING IN CONJUNCTIVA.

Dr. Charles P. Small exhibited a young man who had an inflammatory swelling in the conjunctiva of the right eye, which somewhat resembled a phlyctenula. In the left eye there is a deep-seated opacity of the cornea. The patient appears to be entirely well, although when a young boy he had trouble with his hip joint, thought to have been caused by a fall. A few years ago the joint was resected and is now ankylosed. He also had scarlet fever with otitis media, the suppuration continuing for a number of years, then stopping, only to break out afresh. The ear is still suppurating. The Calmette reaction was looked for, the tuberculin being instilled into the left eye. A marked reaction was obtained.

Dr. W. E. Gamble thought that the process was rather too acute for tuberculosis, and that while a positive Calmette was obtained, this did not necessarily imply that the tuberculosis was of the eye. The focus might be elsewhere in the body.

Dr. Oscar Dodd considered it a typical case of tuberculous scler-keratitis, such as Verhoeff, of Boston, reported. Verhoeff explained the paroxysmal appearance and disappearance of the nodules by assuming the presence of some focus in the body elsewhere than in the eye. Therefore Dr. Small's case would probably soon subside. He does not like to use the Calmette test because of the bad results which are likely to follow. He knows of instances where the reaction persisted for months, even starting up a latent process.

HYSTERICAL BLEPHAROSPASM; REPORT OF CASES.

Dr. N. Remmen reported three cases of hysterical blepharospasm.

Dr. L. W. Dean referred to a case of double-sided functional amblyopia and blepharospasm with one-sided deafness that he had had under observation and in which treatment was ineffectual. Finally the patient was placed in a college for the blind, where she was put to work in the kitchen. After two or three months she was discharged, apparently well, although the fields were badly constricted. Eight or nine months ago she returned with a one-sided amblyopia and blepharospasm, from which she is still suffering. Treatment is ineffectual.

Dr. D'Orsay Hecht emphasized the fact that hysterical blepharospasms, as well as many other hysterical conditions referable to the eye and eyelid, are of great interest to the neurologist, who is likely to see quite as many of these cases as does the ophthalmologist. It is regrettable that these patients are not seen early enough, as this is a matter of some consequence in instituting successful treatment, depending upon promptness, more especially in the cases of very acute onset. When a patient has been subjected to a protracted treatment at the hands of the oculist, the chance for a timely and efficient cure is certainly impaired. He thought that there was some ambiguity clinging to the term blepharospasm, and that it was too often used interchangeably with the more common expression of habit spasm or tic. The eyelid tic, particularly in its unilateral form, is perhaps the most common of all tics. The condition of blepharospasm should be more thoroughly differentiated from tic than it is. A blepharospasm should be regarded as such only so long as it is contingent upon an acute sensory irritation, a demonstrable lesion or some irritation succeeding it. As soon as the source is removed and the irritation no longer continued, it should cease to be called a spasm, and becomes purely a tic. The physical has been replaced by the psychic

impression, and the subsequent treatment must depend upon a thorough appreciation of this fact.

With reference to the second case reported by Dr. Remmen, and referred to by him as incurable, Dr. Hecht thought it should be looked upon as an obstinate case, one not likely to yield as quickly as if the onset had been acute, but nevertheless not without an ultimately good prognosis.

As concerns the hysterical ptosis, referred to as occurring in a child, that manifestation was rather unusual, but not at all rare, if one keeps reminded of the fact that hysteria occurs very much more commonly in children than is generally thought. Eyelid tic, chronic blinking, is very common among children. In making a diagnosis of hysterical ptosis, he thought it relevant to add that myasthenia gravis should not be lost sight of as a diagnostic possibility. Dr. Hecht cited an instance in his own practice of what the oculist would have chosen to call hysterical blepharospasm, which could not be so regarded if it is admitted that no demonstrable sensory irritation was causative of the condition. A man had attended a banquet, in the course of which a flashlight picture was taken. The technic had not been perfected to the point of collecting the smoke in bags, as is since the custom. With the bright flash of light there developed a strong tonic contraction of the lids of both eyes, which very promptly gave way to continued clinic spasms. He was seen within forty-eight hours of the occurrence, and after a careful examination Dr. Hecht concluded that there was more of a psychic element than one of sensory local irritation, although the smoke might be regarded as such. A very powerful galvanic current was passed through the head by placing an electrode at each temple, producing a well-known sensation of a flash of light. This galvanic sensory impression, re-enforced by emphatic suggestion, caused an immediate cessation of the aggravated tic, and, after two more applications on successive days, permanent relief was had. Here was an instance in which the promptness of the remedy applied, together with some ingenuity in the plan of treatment, was conducive to a favorable result.

Dr. W. E. Gamble reported a case in this connection. A child, four years of age, developed blepharospasm after an attack of measles. All efforts to produce a cure were ineffectual. The mother of the child had a bottle of peppermint in the cupboard on the same shelf with a bottle of atropin. One morning the child got hold of the atropin bottle, drank some of its contents and became thoroughly intoxicated with atropin. The necessary antidotes were administered, and the child recovered. The blepharospasms had subsided, and remained away for two weeks, and then returned. The child took violently ill with pneumonia, and the blepharospasm subsided and never returned.

Dr. William H. Wilder asked Dr. Hecht in regard to the differentiation of these cases of tic from blepharospasm. Sometimes it is quite difficult to say whether there is any lesion in the eye that might excite blepharospasm. Sometimes such cases seem to be excited by retinal hyperemia manifested by peculiar granular appearance of the pigment layer of the retina around the yellow spot. Such persons oftentimes have more or less photophobia, and often are persons to whom the electric light is very annoying. He has had one case in which he had to interdict the use of electric light for reading because of its influence on the retina. These cases are more marked when caused by a very strong flash, such as is seen when a strong current is suddenly grounded. He has seen cases where such a flash has caused both conjunctival and retinal hyperemia. The men who get that way are put to work to blow out a plug which resists the ordinary mechanical means of blowing out. The face must be protected with a very dark glass to avoid burning. These men will often have a blepharospasm follow on the retinal hyperemia, so that it is difficult to differentiate between the tic and the blepharospasm caused by some demonstrable lesion.

Dr. Hecht said that it was perhaps not wholly essential that the sensory irritation be demonstrated since, to his way of thinking, anything that would induce a hyperesthesia in the ocular apparatus could be regarded as sufficiently irritant and unpleasant. If it were enough to cause involuntary tonic or clonic contraction of the eyelid, it, properly speaking, would be a spasm.

Necessary for its continuance would be a psycho-neurotic element, and with the former removed, but the latter remaining, the premises were favorable for the superimposed tic; in other words, in all or nearly all of the cases that develop tic there is a substratum of psychic or neuropsychic instability which must be sought for and recognized. Given the same amount of sensory irritation in a normal individual, a tic would not be expected to supervene.

Dr. Wilder asked whether neurologists entertained the idea that autointoxication plays any rôle at all in producing these habit spasms.

Dr. Hecht said that so far as the curability of tics is concerned, it has been clearly demonstrated that it is a matter of stimulating in patients a better capacity for motor discipline and persistent efforts at re-education. Tics do get well, even after they have been chronic. He has had occasion to treat several apparently intractable eyelid tics by keeping patients in a darkened room, with the instruction to rhythmically half open and close the eye, while following this maneuver intently by looking into a looking-glass and persisting in it for one hundred counts. Many modifications of these procedures may be instituted, and considerable ingenuity applied in this educational method of treatment. It may take many months to bring about improvement, and then again, with the slightest provocation, there may be recurrences, but in spite of these handicaps not all cases that are chronic and discouraging should be looked upon as incurable.

Dr. Remmen said that in one case he corrected the refraction error and encouraged the family not to refer to the patient's trouble. The patient recovered. The tic in this case consisted of a little jerking of the eyelids, a twitching. He believes that a blepharospasm is a very much more violent affair than the ordinary tic.

IMPROVED SHELL FOR TENON'S CAPSULE.

Dr. George F. Suker exhibited a shell that is a substitute for the shell usually used after a Mule's operation. It is enclosed in the capsule of Tenon, and gives a large stump for an artificial eye. The shell is an almond-shaped glass globe. It causes no irritation, and permits of free lateral movement of the artificial eye.

Dr. Oscar Dodd has had the trouble of not having an artificial eye fit properly over the ordinary sphere. Motion is suspended or imperfect. He thought that Dr. Suker's shell would probably obviate that difficulty.

Dr. Suker emphasized the necessity of perfect asepsis. The conjunctival sac must be absolutely free from discharge, more so than in a cataract extraction. Since using this modified sphere, he has had less difficulty in fitting an artificial eye, and better results with regard to motion.

WILLIS O. NANCE, Secretary.

Regular Meeting, April 12, 1909.

A regular meeting was held April 12, 1909, with the president, Dr. Frank Allport, in the chair.

CASE OF INSTERTITIAL KERATITIS.

Dr. W. F. Coleman reported a case involving the left eye, the infiltration extending over the whole cornea so that the patient barely had light perception. He was given mercurial treatment and injections of sodium saccharate, and, now, after one year, he has 20/20 vision. All that remains is a circular band intermediate between the center and the circumference of the cornea, of a dusky-red opacity without any Hirschberg's lines. On January 21 the opacity was materially less and vision was 20/25; there was photophobia, lachrymation, moderate discomfort, no iritis, but the infiltration had extended to the right eye, and the patient in one week barely had light perception. After six weeks he had an iridocyclitis. There was no typical vascularization of the cornea until six weeks after the initial stage. He was finally put under the 500 candle-power light for fifteen minutes daily and in one week his vision came up to 15/100 and in two

weeks more to 20/30. In the last three weeks he had a relapse, with vision reduced to 20/40, with considerable pain, which was relieved by blood-letting of the temple.

CALCAREOUS KERATITIS

Dr. W. F. Coleman presented a patient with a calcareous keratitis, a transverse calcareous film of long standing, at least thirty years. An iridectomy had been done, with some improvement. There was no history of previous eye trouble to account for the condition. Dionin for one year proved ineffectual; then sodium chlorid, 5 per cent., was injected and after the first two or three injections there was considerable improvement, although there is no reason to hope for a permanent improvement.

Dr. Oscar Dodd treated a somewhat similar case, but with less calcareous infiltration and consequently better vision. He operated on both eyes and got a very excellent result. Vision improved from 15/200 to about 20/80, and the intense irritation and dread of light passed away. The infiltration was above the Bowman's membrane, except at the margin of the cornea, where it extended into the deep layers of the cornea. He was able to peel off the infiltration and the epithelium grew over the cornea with very slight opacity and a greatly improved condition. Dr. Coleman also presented an improved membrane punch.

VOLUNTARY RECESSION OF THE GLOBE WITH SIMULTANEOUS LID CLOSURE.

Dr. Frank Brawley exhibited this case for Dr. Murray.

A CASE OF ANIRIDIA.

Dr. Hugh Blake Williams reported a case of aniridia occurring in a girl aged 9 years, one of four children, all healthy and the parents as well as far as the eyes were concerned. Vision in the right eye was 4/200; left, 5/200. She had a mixed nystagmus, microphthalmus and total congenital aniridia, with pyramidal cataracts and the cortex of both lenses somewhat opaque. With an apparatus suggested by Dr. Chas. H. Beard and devised by him, consisting of two blackened coquilles with stenopaic slit at 180 degrees, vision came up to 20/200, with crossed stenopaic slits, one of 90 degrees, the other at 180 degrees, to 21/100. Then Mr. J. T. Brayton constructed two brass bowls with a curvature equal to 25.00 D., and over the eyeball a disk about three-quarters of an inch in diameter was cut out and crossed stenopaic slits were placed in this. By making the curvature of these disks 9.75 D. toward the eye, vision came up at once. She has 8 to 16 D. myopia. He then ground a pair of minus 8 disks in a light tint about one, placed them in front of the stenopaic slits, bringing vision up to 20/60, so that the patient is now quite comfortable, has no difficulty in sunlight, sees well in the distance, but vision for near is still very much reduced, and she prefers for reading the number four coquilles.

MELANOSARCOMA.

Dr. H. H. Brown reported the case of a man, aged 51 years, who was operated on eleven years ago for an epithelioma of the upper lip. He made a rapid recovery without evidence of further involvement for about fifteen months, when it was found necessary to remove all the lymphatics of the right side of the neck. Six months later the submaxillary gland on that side was removed, and a year later he had the sublingual gland removed. For five years he seemed to be in perfect health. Last fall his sight began to fail and in January, 1909, he had a distinctly opaque cornea with tension plus 2. An interesting feature of the condition was that it would last for three days and then all evidence of irritation would subside and the eye assumed almost a normal appearance. In March Dr. Brown did a very deep iridectomy, with the hope of relieving the man from the frequent attacks of glaucoma. Tension would disappear under enormous doses of salicylate of sodium, 30 grains, every three hours, and the man would be perfectly comfortable for three days, when there was a recurrence of the condition. Finally an enucleation was done, and an examination of the tissues removed disclosed a

melanosarcoma, which had its beginning in the ciliary body in the upper nasal quadrant and extended back nearly to the disc. The man's physical condition was excellent throughout.

FIBROMA OF CORNEA.

Dr. William A. Mann reported a case of congenital fibroma of the cornea in a girl aged 19 years. The tumor was vascular and extended from just above the limbus to below the center of cornea, was circular, 9 mm. in diameter and 3 to 4 mm. in thickness. There had been no enlargement since birth.

The tumor was removed with a Graefe knife and the surface curetted. The growth was examined by Dr. Zeit. Vision improved from 1/100 before operation to normal after operation.

Dr. Mann stated that in looking over the literature he found a few cases of fibroma of the cornea, but only one congenital case.

AN ANALYTICAL CRITICISM OF THE CARDINAL EYE SYMPTOMS OF EXOPHTHALMIC GOITER.

Dr. George F. Suker, after presenting the signs of the disease, drew the following conclusions: From the description and analysis of the various signs we can with propriety discard all the various theories advanced for the causation of these signs excepting the increased muscle tonus which is brought about by the direct activity of the thyroid toxin, either by way of the nerve fibers or directly upon the muscles themselves. No doubt the individual anatomic construction of the conjunctival fascia, as well as the individual size of the globes, are but incidental contributing factors. Also, that the so-called Muller's muscle is not the important factor, while the cylinder of plain muscle fibers springing from the septum orbitale (Landstrom) is all-important. It can also be seen that all of the lid signs are exceeedingly closely related as to the direct cause, but symptomatically independent of one another. That there is a causal relation between the Stellwag and von Graefe sign must be accepted. One sign is just as valuable as the other in all its aspects, and the characteristics of all are very similar. The exophthalmos sustains a slight relation to all, a contributing factor. The vasodilation which necessarily results from the sympathetic interference is but a secondary consideration in each sign. The anatomic variances in the conjunctival fascia is at no time a direct etiologic factor. Each one of the signs can be intrinsically modified by the absence or presence of an anatomic lesion.

Finally all of the lid signs are dependent upon a stimulation of the sympathetic nerve fibers and the palpebral muscles supplied by them; in addition, there is a directly increased muscle tonus. This view is further substantiated by the fact that a paralysis of the sympathetic produces almost the exactly opposite train of lid symptoms. Above all, it is more than passing strange that the iris seldom is involved, though the fibers are so profoundly implicated. Lastly, the writer stated that literature references are rather abundant to sustain the contentions made, and that his personal observations are in accord with these facts.

Dr. Wm. Wilder said that many years ago he noted a sign not described in text-books, which was confirmed by consulting neurologists, and he has also seen the same sign since in cases of exophthalmic goiter. If the patient is asked to follow the finger which is moved steadily through a certain arc, the eye does not follow the finger evenly and steadily, but in a jerking manner. It is not an invariable symptom and does not always speak for exophthalmic goiter, but it was found other lid symptoms were not present. He thought with Dr. Suker that probably all these symptoms are due to hypertonicity of the muscles. The sign was also found in cases of a lateral spinal sclerosis, multiple sclerosis, and might be compared with the voluntary tremor of the latter condition.

Dr. Suker has also observed this sign in one or two cases and is convinced that the entire group of symptoms is due to hypertonicity causing a stimulation of the sympathetic system.

STAPHYLOCOCCUS VACCINATION IN PHLYCTENULAR DISEASE.

Dr. Henry Gradle, on the assumption that the prolongation of the disease so often met with in the later attacks of phlyctenulæ might be due to secondary in-

vasion by staphylococci, quite commonly found, tried in such cases the injection of cultures killed by heat. He selected nine consecutive cases of protracted phlyctenular disease showing staphylococcus in smears which had proven rebellious to the usual treatment. In every instance improvement began at least after the second injection at intervals of one week. In two and one-half to four weeks all irritation had disappeared. While a similar gradual recovery might have occurred in any one case with staphylococcus vaccination it could not have been expected with such regularity in a whole series of cases previously rebellious to customary treatment. Since staphylococci are not the original cause of phlyctenulæ, this treatment does not protect against a later reappearance of the disease. The most striking observation was that of a very low degree of superficial keratitis (post-phlyctenular) which had persisted for a year and had not yielded to previous appropriate treatment. The disease disappeared completely after four vaccinations.

Dr. W. A. Mann has used the staphylococcus vaccine in four cases in which other methods of treatment had not sufficed to effect a cure. One case was traumatic ulcer, another an ulcer dependent on rheumatic etiology, and two cases were associated with acne. These were seen in the later stages of the disease, when the ulcers had almost healed and the injections of the vaccine were given to prevent a recurrence of the ulcer and to cure the acne. The result in each instance was most favorable. He has also used a streptococcus vaccine in cases of iritis of the so-called rheumatic variety with good results.

Dr. W. F. Coleman had one case of severe relapsing phlyctenular keratitis in a child 12 years old, which he treated by the usual methods for six months, and while the patient improved somewhat she never completely recovered. For three months he used the incandescent lamp with good results, although no impression was made on the course of the disease. Finally he resorted to the use of the *x*-ray and, although the cornea was covered for three-quarters of its surface with ulceration, in less than ten days nine-tenths of the opacity had disappeared. The treatment was continued for eighteen months, and now the child has nearly normal vision and there has not been any relapse.

WILLIS O. NANCE, Secretary.

FULTON COUNTY.

The twelfth annual meeting of the Fulton County Medical Society was held in the Canton Chautauqua Grounds, Oct. 5, 1909. Called to order at 10:30 a. m. by President Cluts. The minutes of the May and July meetings were read and adopted. The president appointed Drs. Scholes and Price as an auditing committee, who reported that they had examined the books of the treasurer and found them correct. The treasurer's report was read and adopted. The following officers were elected: President, Dr. F. C. Robb, Farmington; vice-president, Dr. J. E. Coleman, Canton; second vice-president, Dr. Veda C. Murphy, Cuba; secretary-treasurer, Dr. D. S. Ray, Cuba; necrologist, Dr. P. H. Stoops, Ipava; membership committee, Dr. Price, Astoria; board of censors, Dr. Harrod, Avon; delegate to state meeting, Dr. D. S. Ray, Cuba; legislative committee, Dr. W. E. Shallenberger, Canton. Pursuant to notice given at the May meeting, Dr. Chapin offered the following resolution and moved its adoption:

Resolved, That the resolution adopted at the December (1907) meeting, amending Section 7, Article 5, of the constitution, relative to contract practice, be and is hereby rescinded.

The motion, being seconded by Dr. Robb, was carried. Dr. Shallenberger moved that the rule relative to holding applications over one meeting be temporarily suspended and that all new applications be voted on at this meeting. Carried. A majority of the membership committee not being present the president appointed Dr. Hayes as a member of that committee pro tem.

Dinner was served by Mr. Middlekauff. After dinner Dr. M. L. Harris read a paper on the "Early Diagnosis of Cancer of the Uterus." Dr. Harris' paper was discussed by Drs. Percy, of Galesburg, and Robb, of Farmington. Dr. Black, of

Jacksonville, presented a paper on "The Progress of Surgery." Dr. Percy presented a paper on "Some Items of Interest to the Physician Outside of Medicine." Dr. Shallenberger gave a talk on legislative matters. Dr. Becker, of Knoxville, gave a very interesting talk encouraging physicians to take more interest in politics. Unanimous thanks were voted Drs. Black, Percy and Becker for their presence; to the management of the Electric Interurban Railroad for the free transportation to and from the grounds; to the officers of the Chautauqua association for the use of the grounds and buildings, and to Mr. and Mrs. Middlekauff for the palatable dinner and refreshments served.

The membership committee favorably reported on the following applications, and on motion the secretary cast the vote of the members present for their election: Drs. W. D. Nelson, Bryant; R. E. Wasson, Vernon; C. G. Turner, Brereton; C. E. Hershman, London Mills; P. F. Jones, Table Grove; E. K. Dimmitt, Farmington; C. R. Essix, London Mills; D. A. Blair, Ellisville; D. W. Bottorf, Astoria; Dr. Hamilton, Vermont, J. M. Adams, Canton. The following is a partial list of those present:

I. L. Beaty, Fairview.
J. M. Nellis, Canton.
W. D. Nelson, Jr., Canton.
F. C. Robb, Farmington.
D. W. Bottorf, Astoria.
W. D. Nelson, Sr., Canton.
D. A. Blair, Ellisville.
D. D. Kirby, Canton.
G. C. Black, Table Grove.
E. R. Essix, London Mills.
J. M. Allison, Canton.
J. E. Sutton, Canton.
J. S. Barton, Cuba.
S. B. Beers, Fairview.
J. P. Long, Astoria.
A. R. Fowser, Canton.
F. M. Harrison, Bryant.
G. W. Newberry, Smithfield.
A. J. Baxter, Astoria.
E. K. Dimmitt, Farmington.
P. H. Jones, Table Grave.
C. E. Hershman, London Mills.
L. V. Boynton and wife, Vermont.
R. E. Wasson and wife, Fairview.
S. S. Clayberg, Avon.
T. R. Plumer, Farmington.
Elden Price, Astoria.
E. E. Davis, Avon.
R. W. Harrod, Avon.
P. B. Goodwin, Summum.
J. W. Connelly, Farmington.
Veda C. Murphy, Cuba.
Jennie W. Parks, Fiatt.
W. T. Zeigler, Canton.
L. R. Chapin, Canton.
E. W. Reagin, Canton.
E. S. Parker, Vermont.
R. G. Richards, St. Davids.
R. T. Ewan, Smithfield.
C. M. Wilmott, Fiatt.
W. R. Blackburn, Breeds.
C. E. Howard, Lewistown.
E. G. Davis, Lewistown.
C. G. Turner, Brereton.
C. H. Hamilton, Vermont.
R. G. Grimes, Marietta.
H. H. Rogers, Cuba.
Maud T. Rogers, Cuba.
W. M. Roberts, St. Davids.
C. N. Allison, Canton.
P. S. Scholes, Canton.
D. S. Ray, Cuba.
Ben. Taylor, Vermont.
Chas. McCurdy, Vermont.
J. E. Coleman, Canton.
C. E. Black, Jacksonville.
J. F. Percy, Galesburg.
Tonis Becker, Knoxville.
E. W. Ryerson, Chicago.
M. L. Harris, Chicago.

MACON COUNTY.

The Decatur Medical Society met Tuesday evening, Sept. 21, 1909, in the offices of Drs. Parrish and Pollock, Decatur. A phonograph and lantern slide exhibition of the Chicago Tuberculosis Institute was given. This was followed by a paper on "Union of Medical and Public Libraries," by Dr. Ellen F. Grimes, member of the Decatur Library Board. A special meeting of the committee on permanent quarters for the society was held. The following are the officers for 1909-1910: President, J. T. Miller, M.D.; vice-president, J. C. Fisher, M.D.; secretary-treasurer, C.

E. McClelland, all of Decatur. Censors: C. M. Wood, M.D.; O. Yarnell, M.D., and Ellen F. Grimes, M.D. Program committee, Drs. C. E. McClelland, F. M. Anderson, Lynn Barnes and W. W. Fitzpatrick. Medical ethics committee, Drs. H. C. Jones and M. P. Parrish, of Decatur, and Dr. J. H. McNutt, of Hammond.

RANDOLPH COUNTY.

The Randolph County Medical Society met September 7 in the Randolph clubrooms at the Broadway Hotel, Sparta, Ill. Chairman H. L. Gault called the meeting to order. The minutes of the last meeting were read and approved. The following members were present: Drs. Gault, Steele, McKee, Seeley, Ritchey, Le Saulnear, J. W. Robertson, Weir and Brandts; visiting physicians, President J. L. Wiggins, of the Illinois Medical Society, Drs. Weyle and Stephenson. Wm. F. Hager, of Sparta, was an applicant for membership and was accepted by a vote of members present. Dr. H. L. Gault, chairman, gave a short address of welcome. Secretary A. D. Steele made a short report on his visit to the Illinois Medical Society meeting, held in Quincy, May 18 to 20. J. W. Robertson, of Coulterville, reported a peculiar case of supposed enterocolitis. The patient was a woman, aged 23, who died about thirty-six hours after his first visit. A discussion followed by Drs. Le Saulnear, Gault and Steele. The meeting adjourned for dinner, which was given by the resident physicians to all visitors, and a very enjoyable time was spent. At 1:30 o'clock the meeting was called to order. Dr. McKee, for the clinic, presented a colored woman with an aneurism of the common carotid artery. She was examined with interest by all present. Surgical treatment was discussed by Drs. Gault, Robertson and Wiggins. R. M. Ritchey, assistant physician at the Southern Illinois Criminal Insane Asylum at Menard read an interesting paper on "Mental Instability." This paper was praised very highly by Drs. Wiggins and Gault, who applied the rule especially to school children.

A resolution was presented for a vote of thanks to each of the Representatives who voted against the Osteopath Bill, which was defeated in the last General Assembly. Also a letter to be sent to our state senator denouncing his action for voting in favor of the same bill. A vote of thanks was tendered our worthy president, J. L. Wiggins, for the able paper he read on "Medical Organization, Past and Present." A vote of thanks to the members of the Randolph Club and to all the physicians of Sparta for the hospitality shown the society at this meeting was tendered. The meeting adjourned to meet the second Tuesday in May at Prairie du Rocher, the home town of Dr. Brandts.

A. D. STEELE, Secretary.

ILLINOIS MEDICAL COLLEGE UNDER NEW AFFILIATION.

According to recent items in the daily press, it appears that the Illinois Medical College has become a part of the Loyola University, which has been expanded, and includes a law school, an engineering school, colleges, etc.

It would hardly seem necessary to have so many medical colleges in Chicago, but, if it is, it is gratifying to know that this particular college will hereafter be conducted under such good auspices.

The Catholic church the world over has been devoted, as far as medicine is concerned, to the highest ideals, and we trust and believe there will be no departure from these ideals in the medical school now adopted as a part of the new university.

NEWS OF THE STATE

PERSONAL.

Dr. O. L. Pelton, Jr., Elgin, has gone to Europe for a year's study.

Dr. and Mrs. Bernard Fantus, Chicago, have returned from Europe.

Dr. Otto R. Scott, Chrisman, who has been critically ill, is reported to be improving.

Dr. Albert J. Roberts, Ottawa, has been re-elected physician of LaSalle County.

Dr. Emory W. Goembel, Rockford, has been appointed physician of Winnebago County.

Dr. Walter S. Eshbaugh, Marengo, has been appointed deputy coroner of McHenry County.

Dr. C. L. Spicer, Springfield, was elected national medical examiner of the Yeomen of America.

Dr. Robert H. Gault has been appointed instructor in psychology in Northwestern University.

Dr. Wm. W. Meloy, Chicago, was operated on for appendicitis at Passavant Hospital September 19.

Drs. E. Fletcher Ingals, George E. Shambaugh and W. E. Buehler, Chicago, have returned from Europe.

Dr. Otto L. Schmidt, Chicago, has been appointed by the governor a trustee of the Illinois State Historical Library.

Dr. Karl F. Snyder, Freeport, has succeeded Dr. J. F. Fair, resigned, as local surgeon to the Illinois Central Railroad.

Dr. Walter W. Hamburger, Dr. and Mrs. Cassius C. Rogers and Dr. Henry Gradle, Chicago, have returned from Europe.

Drs. G. F. Fiske, L. L. McArthur, A. D. Bevan, John B. Murphy and G. Paull Marquis, Chicago, have returned from Europe.

Dr. Benjamin J. Nauman, Peru, George W. Boot, Evanston, and William B. Peck, Freeport, have returned from Europe.

Dr. Frank H. Blackmarr will hereafter devote his entire attention to office and hospital practice of electro-therapeutics, Suite 735-737 Marshall Field Building.

James B. Gooken, S.B., who was offered an appointment as chemist for the State Pure Food Commission, has decided to remain with the Chicago city laboratories as chemist.

Dr. Elmer L. Kenyon, Chicago, by invitation, led the discussion on stammering at the annual meeting of the Pennsylvania State Medical Society, held in Philadelphia in September.

NEWS.

—By the will of Lawrence McMahon of Urbana, St. Elizabeth's Hospital, Danville, receives a bequest of $700.

—The Civic Federation, Chicago, announces its intention of actively undertaking a campaign against illegal medical schools and "diploma mills."

—Ground was broken October 10 for the new addition to the Norwegian Lutheran Deaconess' Home and Hospital, which is to cost $75,000 and which is expected to be completed next spring.

—A reception was given October 4 by the Physicians' Club of Canton to the Graham sisters, who donated the Graham Hospital to Canton, and the public reception and opening was held on the following day.

—It is reported that Mrs. Leopoldine Boyd has filed a bill for divorce against her husband, Dr. Benjamin Y. Boyd, a Chicago physician, alleging that he had deserted the complainant and was living with another woman.

—Sarah E. Wood, Rock Island, charged, on complaint of the State Board of Health, with practicing medicine without a license and selling drugs and ointments, is said to have been found guilty October 6 and fined $100 and costs. An appeal was taken.

—College students have always had plenty of excuses for flunking, but few as convincing as the 30 per cent. of students at the University of Georgia said to be afflicted with uncinariasis. It affects the scores both within the class room and on the athletic field.

—The fight over the railroad smoke nuisance in Chicago promises to be a Homeric battle. With the city administration reinforced by all the women's clubs in solid phalanx, what will happen to the offenders ultimately is as easy to perceive as the smoke is now.

—The annual class day rush at the College of Physicians and Surgeons in Chicago was so hotly contested that it led to a riot call, caused a blockade of street cars, and was participated in by the fire department. No one was killed, but several required surgical attention.

—The governor has appointed the following committee to investigate pellagra: Drs. Frank Billings, George W. Webster, Howard T. Ricketts and Oliver S. Ormsby, Chicago; Dr. James L. Greene, Springfield; Dr. H. Douglas Singer, Kankakee; Drs. Harris S. Grindley and Ward J. McNeil, Urbana.

—Dr. J. P. Deckard, of Paradise, Coles County, shot and killed Ralph F. Webster, his neighbor, Oct. 26, 1909, and afterward surrendered himself to the authorities at Mattoon. The unfortunate fatality was the result of a quarrel over the depredations committted on Dr. Deckard's property by hogs owned by Webster.

—More than two hundred patients at the Dunning Tuberculosis Hospital were removed to the new hospital on the grounds of the County Hospital last month. The hospital has recently been completed at a cost of $150,000, and it is proposed to move there all the far-advanced patients, retaining the more hopeful cases in the institution at Dunning.

—Dr. Emma Hellwig, said to be a former physician of Chicago, was sentenced, in the Superior Court of Berlin, to pay a fine on a charge of illegally assuming the title of doctor. The court declared that she was entitled to describe herself as an American physician, but that she had no right to use the title doctor of medicine, not having the required university degree.

—At the semi-annual meeting June 29, the State Board of Health declared the St. Louis College of Physicians and Surgeons a medical institution not in "good standing," to date from July 1, 1909; conditioned Barnes University, St. Louis, and declined to restore recognition to the National Medical University of Chicago, which had been declared not in "good standing" a few months before.

—Dr. E. H. Ochsner's buggy was overturned by a speeding auto and the Doctor and his coachman were thrown out and painfully bruised while on the way to a meeting of the Chicago Medical Society October 20. Dr. Ochsner seized the occupant of the auto and held him until a policeman arrived. The party then went to the Hudson Avenue station, where the Doctor signed a complaint of disorderly conduct.

—Rev. Caroline Bartlett Crane, Kalamazoo, at the meeting of the American Public Health Association last month, attacked the government system of meat inspection, and accused the officials of issuing instructions to ignore the inspection rules. The executive committee refused to appoint an investigating committee, as they did not consider that her statements or documents substantiated her charges.

—Financial control of the Post-Graduate Medical School and Hospital of Chicago, which has been held by Dr. Franklin H. Martin since its organization in 1888, has been sold to Dr. William Baum, a member of the board of directors for fifteen years and for several years treasurer of the institution. Dr. Emil Ries has been elected secretary, vice Dr. Franklin H. Martin, resigned, and Dr. Otto J. Stein a director, vice Dr. Frederick A. Besley, resigned.

—Albert H. Squires, a cripple, was arrested on complaint of Dr. A. A. Hermann, South Chicago, October 15, on a charge of obtaining money by false pretense. He claimed to be the Chicago agent for the Health and Accident Insurance Company of Toledo, Ohio. Dr. Hermann recognized him as the man who had previously swindled him on a similar proposition in Newark, Ohio. Squires' address for the next few months will be the House of Correction.

—Concerning the prevalence of hookworm disease in the south, the current *Journal of the American Medical Association* notes the general lack of privies on the farms and the resulting pollution of the soil. The daily papers announce a gift of $1,000,000 by John D. Rockefeller for the eradication of the parasite. Part of the money might be used to build and endow the lowly adjuncts to civilized society and a larger part to hire the crackers to use them.

—The following will constitute the committee from Illinois delegated to attend the Conference on Pellagra, to be held at the State Hospital for the Insane, Columbia, S. C., November 3 and 4: Dr. James A. Egan,

Springfield, secretary of the Illinois State Board of Health, chairman; Drs. George W. Webster, Frank Billings and Walter H. Buhlig, Chicago; Dr. John T. McAnally, Carbondale; Dr. H. Douglas Singer, Hospital, and Dr. George A. Zeller, South Bartonville.

—The Winnebago County Medical Society, at the meeting September 14, was entertained by Dr. S. R. Catlin in a travelog, describing his experiences in a trip to London. The hospitals and sanitary conditions of London were described, and some of the old coffee houses frequented by Drs. Johnson and Goldsmith and other literary lights found in him a sympathetic visitor. The furniture of these old inns is much the same as in Dr. Johnson's time, although the kitchen equipments are improved with modern sanitary arrangements.

—The case of Dr. Byron Robinson vs. Dr. Clara P. Seippel was dismissed from the Superior Court of Cook County on October 11, with judgment for costs against the plaintiff. The precipe was filed in June, but the plaintiff failed to file his declaration when the time came. The basis of the suit was a letter written by the twenty-six physicians on the attending staff of the Mary Thompson Hospital to the managers and trustees of the institution, and the plaintiff took the first step toward beginning a suit for libel in the sum of $25,000 against one of the staff.

—Last month a correspondent of a Chicago paper reported that he saw at least twenty rats running across the table and floor in the dining room of the Elgin Hospital for the Insane. This sensational statement has been denied by Dr. Podstata, who noted as a peculiar coincidence that the institution had been visited a week before by a man who insisted on selling a rat exterminator and was indignant when refused. Dr. Podstata admits that there are some rats in the institution and that a parole patient is engaged with traps in exterminating them. He denies, however, that they infest the dining room.

—It is reported that a suit was filed in court by Dr. J. M. Weiss, who seeks to enjoin Dr. H. W. Johnson from practicing within ten miles of Port Byron until 1916 and to compel the defendant to pay over to him the profits he has earned from practicing there since July, 1909. According to the bill, the defendant sold his practice to Oscar S. Dailey on Oct. 11, 1906, agreeing not to locate in that territory within ten years. Dr. Dailey practiced until Nov. 1, 1908, when he sold his practice to the plaintiff with much the same stipulations. In July last the defendant is alleged to have practiced in the forbidden territory.

—The Twin City Branch of the American Health League met in Champaign October 14 to discuss diphtheria. Dr. S. W. Shurtz, city physician of Champaign, spoke on the topic, "Prevention of Diphtheria and Disinfection." Dr. A. S. Wall discussed "Chemical Diagnosis and Treatment of Diphtheria." Professor Briscoe, Dean Burrill, Dr. McNeil and Professor Curtis, all of the University of Illinois, took part in the discussion. The league resolved that disinfection of infected premises should be done by the city authorities. As it is for the public good it should be a public charge, and the work should be under the authority of the department of health.

PUBLIC HEALTH.

—One of the Chicago papers advises keeping the city laboratory open at all hours, night and day.

—The Board of Health of Rock Island has inaugurated a crusade against expectoration with a fine of $5 for expectorators.

—The Occupational Disease Commission announces that a publicity campaign will be inaugurated with the cooperation of the state officials and medical experts. The scope of this work will include hints for workers and employers in every occupation of injurious nature, extending to household occupations.

—Frederick O. Tonney, A.B., M.D., has been appointed director of the Chicago city laboratories to succeed Dr. J. Favil Biehn. Dr. Tonney was appointed assistant city chemist June 5, 1906, and was promoted to the position of chemist Jan. 1, 1909. In the civil service examination for his present position he passed at the head of five competitors.

—A number of mild cases of typhoid fever in Elgin this fall led the health authorities there to insist on the reporting of cases by the physicians under the authority of the ordinance governing contagious and infectious diseases. Investigation located several suspicious wells and one milk supply said to contain the *Bacillus typhosus*. Samples of the city water have been reported uniformly good.

—After November 15 the Chicago Department of Health will not accept certificates of tuberculin testing of cows in the state except from veterinarians regularly deputized by the state veterinarian. The deputies must report all tests yielding positive as well as negative results. It is the intention of the state to brand all animals giving a positive reaction by punching the letter "T" in the right ear. This will prevent the traffic in tubercular animals.

—The State Fair had two exhibits of special interest to the medical profession: The Pure Food Commission demonstrated how to avoid adulterated and poisoned food. The State Board of Health had a special exhibition in a campaign against tuberculosis. A striking feature was a handsome clock with a placard, "Every time this clock strikes the hour some one in Illinois dies with consumption; one every hour, twenty-four every day, seven hundred and fifty every month, nine thousand every year." A map was shown containing 20 states having adequate appropriations for state sanitaria for consumptives. Illinois was not on this honor list.

—The death of Dr. Cesare Lombroso October 18 last ends the career of one of the greatest students in criminology in the history of medicine. His attention was first directed to the subject by noticing certain abnormalities of the skull while dissecting a soldier executed for killing an officer. The idea of degeneracy developed with his studies into a theory of crime. An entirely new school of criminology has developed from the anthropometric rules he laid down. The treatment of the defective criminal may be in time modified as much by Lombroso's theories as was

the treatment of the insane by the humanitarian impulses of Pinel of Paris, of Wm. Tuke of England, and of Dr. Benjamin Rush of Philadelphia.

—The *Bulletin* of the Illinois State Board of Health for June (issued in October) contains the complete vital statistics for the year 1908, showing a decrease of 2,409 deaths in the year, as compared with 1907. The editorial comments on the comparative incompleteness of the returns from the "non-registration" parts of the state and the need of an effective vital statistics law should appeal to every physician in the state. Births are reported even less fully than deaths. County officials who fail to appropriate funds to pay for the reports are to a degree responsible for the lack of interest among members of the medical profession. W. F. Bodine, superintendent of compulsory education in Chicago, commenting on the condition, said: "Chicago gets a full count on coffins but not on cradles. It's a queer condition of affairs when a child has to die in order that it be officially recorded for the first time that it has been alive."

—Bulletins of the Chicago Department of Health show a reduction in the death rate of 4.3 per cent. for the first nine months of this year as compared with the same months of 1908. There were 51 fewer deaths from typhoid fever, 69 fewer from tuberculosis and 100 fewer from acute intestinal disorders, including "convulsions." An increased mortality is noted from heart diseases, Bright's disease, diphtheria, cancer and violence. The three chief acute impure-air diseases, pneumonia, bronchitis and influenza, show a very slight increase, 3,872, as against 3,840. An increase of the deaths from pneumonia early in October caused the department to repeat its warning against shutting up the houses tight on the approach of chilly or cold weather. "The thing to do is to stop lowering your resisting power. Quit poisoning yourself with foul air. Breathe good, pure air all the time, especially while sleeping. Keep your windows open day and night. Don't be afraid of cold air. Pure cold air does not cause pneumonia. It's dirty, foul air that causes pneumonia."

—Acting Assistant Surgeon Moorer of the Public Health and Marine-Hospital Service reports in the *Bulletin* of October 15 as follows: "During the past five years there have been six cases of pellagra under my observation at the Georgetown, S. C., Infirmary. Four of these cases came from the county chain gang. I mistook the first case for Addison's disease, but noticed instead of pigmentation in mouth and fauces a raw and bleeding surface. Then the bronzed skin peeled, leaving raw surfaces. The bronzing of the skin appeared on the dorsal surfaces of arms and backs, and especially the neck. There were intense intestinal and trophic disturbances, and anorexia and lassitude connected with all the cases. Only one became so deranged mentally as to require treatment at the insane asylum. The majority of cases were in persons of negro race between the ages of 20 and 40 years. The treatment employed in these cases was: Strychnin, arsenic, and the tincture of iron in large and

increasing doses, and a strict dietary of from 2 to 3 quarts of milk, with from 8 to 10 raw eggs a day. Five of the cases have completely recovered. The fate of the sixth case, which was sent to the state asylum for the insane, is unknown to me."

NEW INCORPORATIONS.

—Bernard Macfadden Healthatorium; $2,500; operate sanitarium; B. F. Langworthy, J. P. Graham, C. M. Gibler.

—Central Health Institute; $2,500; conduct hospitals and deals in drugs and surgical appliances; M. M. Livingston, M.D., Edith B. Lowry, O. A. Livingston, R. J. Lambert.

REMOVALS.

Dr. R. O. Early has removed from Galesburg to Albia, Va.

Dr. H. D. Roshget has removed from Gibson City to Galva, Ill.

Dr. F. W. Kerchner has removed from Belleville to Glen Carbon, Ill.

Dr. A. L. Collins has removed from Milmine, Ill., to Long Creek, Ill.

Dr. S. F. Brownfield has removed from Galesburg to Brookfield, Mo.

Dr. A. G. Brubaker has removed from Mt. Morris, Ill., to Burlington, Ind.

Dr. Nellie C. Flint has removed from Geneseo, Ill., to Jennings, La., L. B. 642.

Dr. A. W. Moore has removed from Bristol, Kendall County, to Sugar Grove, Ill.

Dr. F. H. Powers has removed from Champaign, Ill., to 4012 Sheridan Road, Chicago.

Dr. H. H. Hanly has removed from Havana to 3001 Calumet Avenue, Flat 3, Chicago, Ill.

Dr. George E. Southwick, of Beamington, Sangamon County, has removed to Chatham.

Dr. C. J. Smith has removed from Kankakee to 1200 Greenwood Avenue, Wilmette, Ill.

Dr. C. F. Ely has removed from 1510 Dearborn Avenue to 34 Washington Street, Chicago.

Dr. Edmund A. Boas has removed from 1154 Wells Street to 1205 LaSalle Avenue, Chicago.

Dr. J. Frank Friesen has removed from 162 West North Avenue, Chicago, to Buhler, Kans.

Dr. G. W. Boot has removed from 1948 Sherman Avenue to 800 Davis Street, Evanston, Ill.

Dr. H. L. Barnes has removed from 1314 South Fifth Avenue, Maywood, Ill., to Pewaukee, Wis.

Dr. Harry Kohn has removed from 3425 South Park Avenue to 5322 South Park Avenue, Chicago.

Dr. Richard M. Fletcher has removed from 609 Rush Street, Chicago, to Deerpath Inn, Lake Forest, Ill.

Dr. Emma C. Hackett has removed from 1700 Broadway, New York City, to "Waupell Lodge," Dubuque, Iowa.

Dr. C. C. Atherton has removed from 1201 Terminal Station, South Bartonville, to 59 Warren Avenue, Chicago, Ill.

Dr. S. Lewin has removed from 6501 Howard Avenue to Vendome Hotel, Sixty-second Street and Monroe Avenue, Chicago.

MARRIAGES.

RUTH VAIL, M.D., and Albert Taylor Snow, both of Chicago, September 7.

ELIJAH C. TROUT, M.D., to Miss Vernice L. Petty, both of Birds, Ill., September 8.

GEORGE HENRY SCHROEDER, M.D., to Miss Elsa Niemeyer, both of Chicago, September 18.

ALFRED NICHOLAS MURRAY, M.D., to Miss Edna Auretta Schmidt, both of Chicago, September 30.

WILLIAM JAMES SWIFT, M.D., of Chicago, to Miss Florence Josephine Lang, of Berlin, Ont., October 6.

HERMAN WINFORD BUNDY, M.D., of Sadorus, Ill., to Miss Edith Stone of Tolono, Ill., September 29.

EDWARD E. NATHAN, M.D., Chicago, to Miss Julia Goldberg, of Deadwood, S. D., in Chicago October 1.

VICTOR MACKAY DALY, M.D., to Miss Violette Berry Helm, both of Pontiac, at St. Paul, Minn., September 8.

BYRON G. R. WILLIAMS, M.D., Paris, Ill., to Miss Margaret Elizabeth Mahoney, of Lexington, Ky., September 8.

GEORGE STANBERRY WALKER, M.D., to Miss Mabel Robinson. both of DeLand, Ill., at Bloomington, Ill., September 15.

DEATHS.

ROY WELCH, M.D. St. Louis University, 1907; died at his home in Lincoln, Ill., from malignant endocarditis, September 7, aged 30.

ALFRED ERNEST PLEAVIN, M.D. Bennett Medical College, Chicago, 1906; died at his home in Elgin, Ill., September 22, from acute meningitis, aged 29.

ERNEST CLARK GWINN, M.D. College of Physicians and Surgeons, Chicago, 1906; formerly of Sadorus and Paris, Ill.; died in Monrovia, Cal., from pulmonary tuberculosis, September 9, aged 28.

RILEY S. LYCAN, M.D. Homeopathic Hospital College, Cleveland, Ohio, 1880; a member of the Illinois State Medical Society; died at his home in Paris, October 2, from pulmonary tuberculosis, aged 54.

W. L. Fleming, M.D., Shelbyville, died Oct. 10, 1909, aged 75. Dr. Fleming graduated at the Missouri Medical College in 1869 and had practiced in Shelby County ever since. The cause of death was tuberculosis.

Henry Ziesing, M.D. University of Giessen, Germany, 1851; Illinois Army Board, 1865; a surgeon of volunteers during the Civil War; for many years a practitioner at Peru, Ill.; died at his home in that city, September 11, aged 80, from paralysis.

Henry A. Eidson, M.D. Rush Medical College, Chicago, 1880; a member of the Illinois State Medical Society and of the local board of the U. S. pension examining surgeons; died suddenly while making a professional call at his home in Willow Hill, October 7, aged 62, from hemorrhage.

Charles Horace Evans, M.D. Homeopathic Medical College of Pennsylvania, Philadelphia, 1869; of Chicago; from 1897 to 1904 lecturer on materia medica in Hahnemann Medical College; died in Union Hospital, Chicago, October 4, after an operation for carcinoma of the stomach, aged 62.

Joseph W. Wassall, M.D. College of Physicians and Surgeons, Chicago, 1884; of Chicago; a member of the American Medical Association; for several years dentist to the Czar of Russia; was washed from the deck of a yacht in Lake Michigan, off Racine, Wis., September 18, and drowned, aged 51.

Howell Emolyn Davies, M.D. Rush Medical College, Chicago, 1902; a member of the American Medical Association; fellow in bacteriology, University of Chicago, 1897-1900; and instructor in gynecology in his alma mater in 1902 and 1903; died at his home in Emporia, Kans., August 26, from typhoid fever, aged 38.

John Joseph Quirk, M.D. Rush Medical College, Chicago, 1888; a member of the American Medical Association; adjunct professor of skin and venereal diseases in the College of Physicians and Surgeons, Chicago, and the Chicago Clinical School; secretary of the local board of U. S. pension examining surgeons; died at his home in Chicago, October 4, aged 44.

Edwin Rutherford Willard, M.D. Rush Medical College, Chicago, 1852; of Joliet, Ill.; a member of the American Medical Association; consulting surgeon to St. Joseph's and Silver Cross hospitals, Joliet; surgeon of the Thirteenth Illinois Volunteer Cavalry during the Civil War; died at his old home in Wilmington, Ill., June 22, from nephritis, aged 79.